Ministry of Higher Education and Scientific Research
Al-Ayen University
The 2nd International Scientific Conference of
Al-Ayen University

ISCAU-2020

Abstracts of the Second International Scientific Conference of Al-Ayen University

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Contents

About the University

Al- Ayen University is a solid scientific institution that aims to create a promising generation and was established in accordance with the Private University Education Law No. 25 of 2016

It is located in Thi-Qar governorate near MIGA Mall. The University includes the five colleges of Dentistry, Pharmacy, Health and Medical Technology, Engineering of Oil and Gas, Physical Education and Sport Sciences. It is distinguished by modern laboratories, foreign and Iraqi teaching staff as well as distinctive classrooms that will help students in consolidating their scientific level.

Also, achieving world class quality in the quality of educational programs and services provided within the University, assigning scientific research to serve national development issues by relying on advanced technology, especially information technology, developing competitiveness in the field of education and research between Iraqi and international Universities.
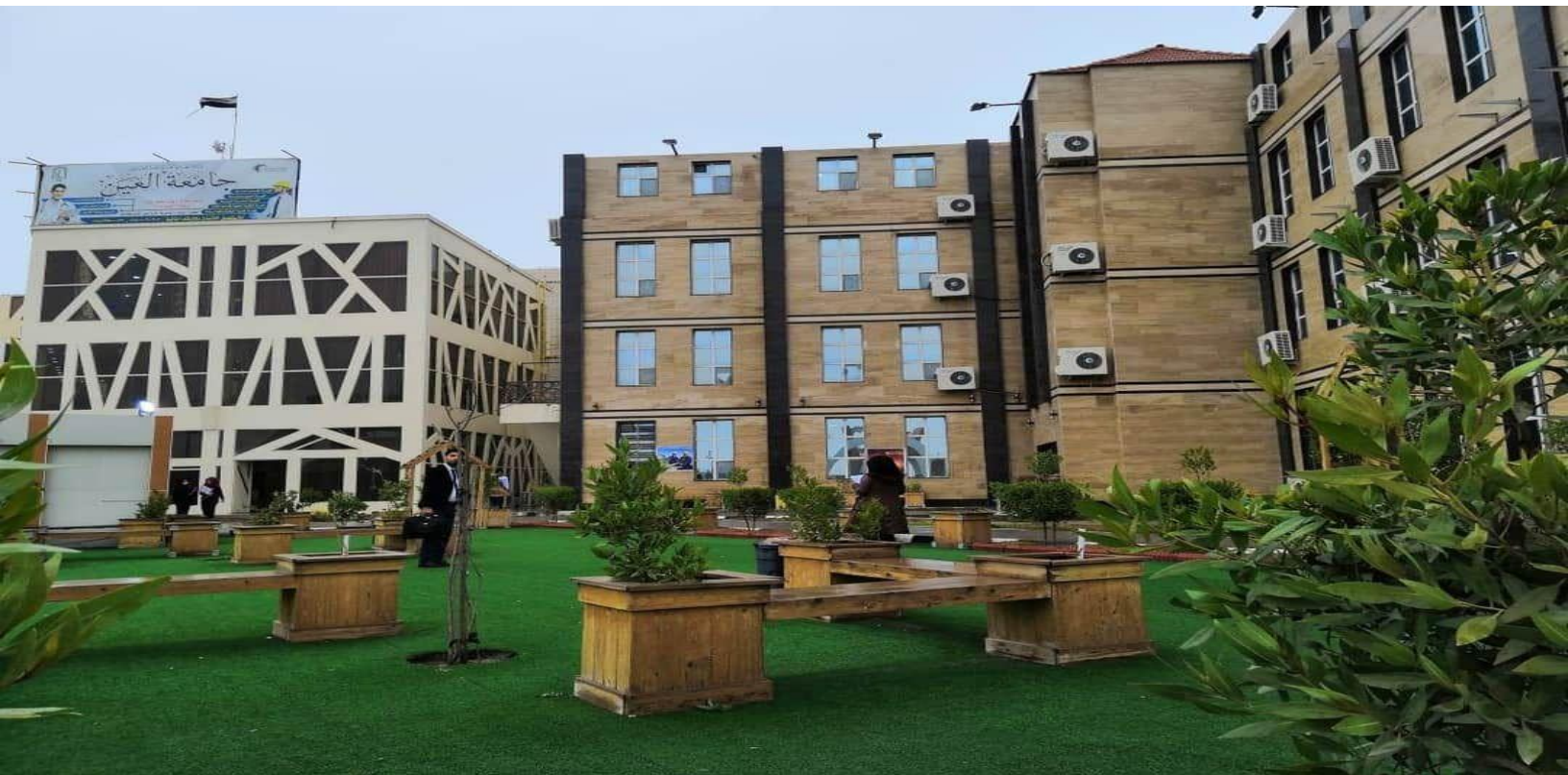
جامعة العين مؤسسة علمية رصينة تهدف لخلق جيل واعد تأسست وفقاً لقانون التعليم الجامعي الأهلي رقم 25 لسنة 2016.تقع في محافظة ذي قار قرب ميكا مول.

إن الجامعة تضم خمس كليات وهي: كلية طب الأسنان و كلية الصيدلة و وكلية هندسة النفط والغازو كلية التقنيات الصحية والطبية وكلية التربية البدنية وعلوم الرياضة. كما أنها تمتاز بالمختبرات الحديثة والكادر التدريسي الأجنبي والعراقي بالإضافة إلى قاعات دراسية مميزة ستساعد الطلبة في ترصين مستواهم العلمي.

تسعى جامعة العين على ان تكون واحدة من الجامعات المحلية والاقليمية الرائدة في التعليم الجامعي والبحث العلمي وذلك من خلال تطبيق المعايير العالمية في المعرفة والتعليم والابحاث العلمية وخدمة المجتمع
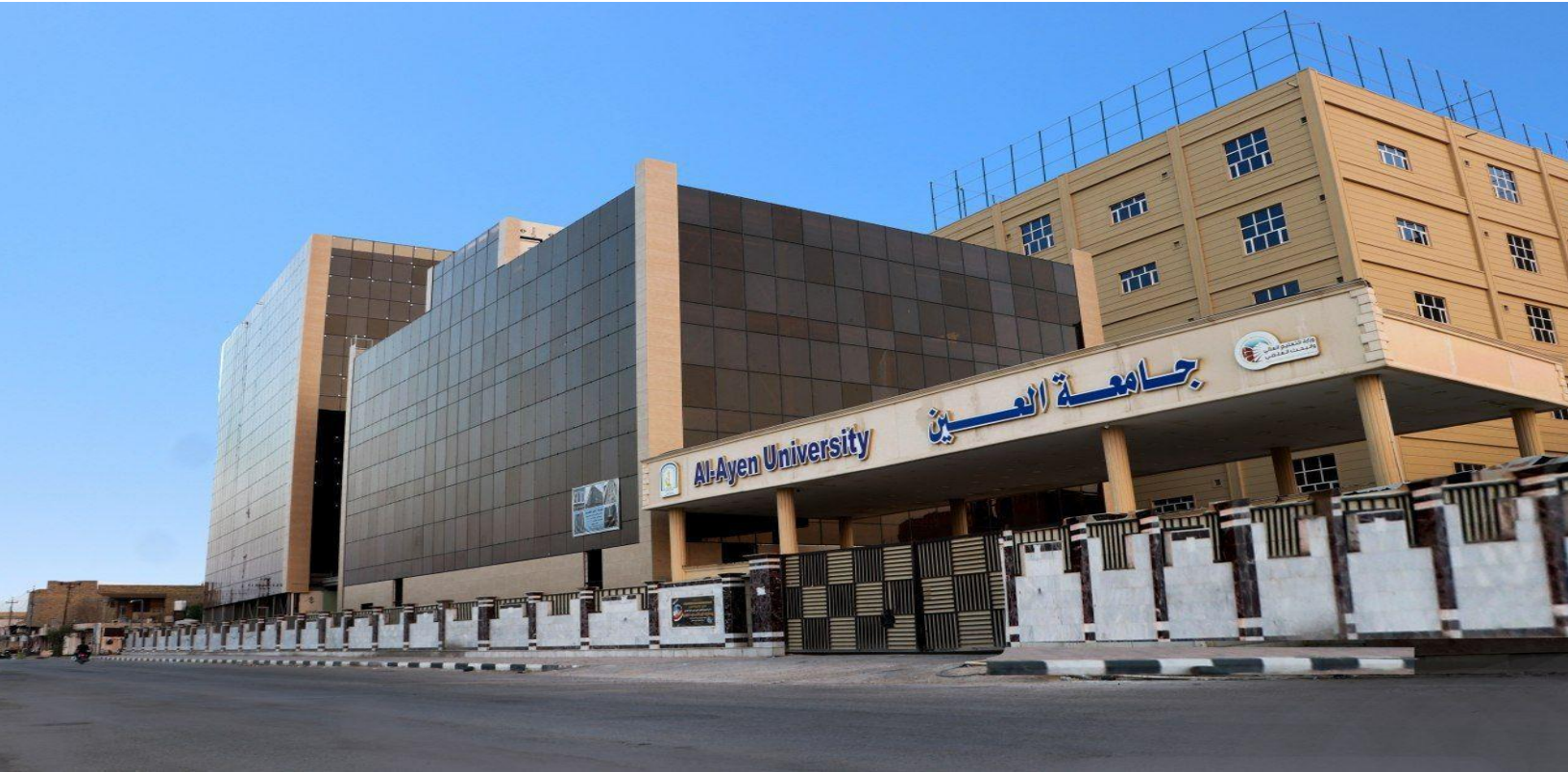
About

Under the Auspices of the Minister of Higher Education & Scientific Research Prof. Dr. Nabeel Kadim Abdul Al-Sahib and under the supervision of the president of Al-Ayen University Prof. Dr. Moneer Hameed Tolephih. The Al-Ayen University held scientific conference entitle "2nd International Scientific Conference of Al-Ayen University" in the period 15-17- July 2020

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عن المؤتمر

برعاية معالي وزير التعليم العالي والبحث العلمي الاستاذ الدكتور نبيل كاظم عبد الصاحب المحترم وبأشراف السيد رئيس جامعة العين الاستاذ الدكتور منير حميد طليفح السعدي المحترم. اقامت جامعة العين مؤتمرها العلمي بعنوان " المؤتمر العلمي الدولي الثاني لجامعة العين" للفترة من 15-17 تموز 2020 .

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كلمة رئيس الجامعة

برعاية معالي وزير التعليم العالي والبحث العلمي الاستاذ الدكتور نبيل كاظم عبد الصاحب المحترم انطلقت فعاليات المؤتمر العلمي الدولي الثاني بمشاركة باحثين من ثمانية عشر دولة عربية واجنبية للفترة من الخامس عشر والى السابع عشر من تموز للعام 2020. وضم المؤتمر مشاركة أكثر 586 بحث علمي ضمن محاور علوم الحياة والعلوم الطبية والفيزياء والفيزياء الطبية والحاسبات وتقنية المعلومات والكيمياء والرياضيات والهندسة والتربية البدنية وعلوم الرياضة.

وتعد اقامة المؤتمر تحدي كبير بما نعيشه هذه الايام العصيبة التي تمر على العالم وتحدياتها الكبيرة متمثلة بجائحة كورونا وما سببته للعالم اجمع من خسائر اقتصادية فضلا عن اثارها الاجتماعية والنفسية رغم هذا التحدي الكبير فان العلماء والباحثين ألوا على انفسهم إلا النهوض بأعباء المرحلة وشحذ الطاقات والهمم وديمومة الابداع ومواصلة العطاء من اجل ابقاء شعلة العلم والمعرفة منيرة وضاءه.

هذا وقد استغل علماء وباحثين جامعة العين هذه الظروف لتحويلها الى انجازات علمية من خلال عقد المؤتمرات العلمية والندوات والورش لزيادة التواصل بين الباحثين من مختلف دول العالم وهذا يعد احد مميزات هذه المرحلة.

Physics Papers

CONTENTS

Theoretical Study for Some Physical Concept

Rashid Hashim Jabbar, Israa Hadi Hilal

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Abstract: This study aims to verify the possibility of converting the charge into energy as is the case in converting the mass into a charge according to the law of the relationship between the charge and the mass of Einstein, as well as calculating the wavelength accompanying the charge carried by the moving charged body, as well as studying the phenomenon of producing a pair more deeply.

Keywords: Charge; wavelength; Energy; pair production.

Pump-Probe Technique to Study of the All-Optical Switching Properties of Copper Phthalocyanine Thin Film prepared via Pulsed laser deposition

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Abstract Z-scan has been utilized for studying the non-linear properties and optical limiting behaviors of the dye Copper Phthalocyanine thin films. The refractive index is negative, which indicates a self-defocusing behavior and non-linear absorption coefficient (β) of CuPc is a positive sign is a result of RSA. The optical switching behaviors of dye have been researched with the use of the method of the pump-probe with 9ns Q-Switched Nd: YAG laser at pump beam equal to 532 nm and a probe beam equal to 630nm Diode laser. The thin films of copper Phthalocyanine also reflect a significant limiting of the optical power of CW laser with an adequate threshold of the optical limiting. The dye's switching behavior is a result of the probe beam's excited-state absorption (ESA) with the molecules of the dye. The modulation of the probe beam with the increase of intensity of the pump has been researched as well.

Keywords: Copper Phthalocyanine; thin film; PLD; NLO materials; All optical switching; excited-state absorption (ESA).

Dielectric properties and A.C electrical conductivity analysis of $(La_2O_3)_{1-x}(ZnO)_x$

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Summery

The A.C conductivity of three samples of lanthanide oxide : zinc oxide $(La_2O_3)_{1-x}(ZnO)_x$ pellets with different zinc oxide content which were sintered 1273 K temperatures were studied using LRC meters in the frequency range of 50–10^6 Hz at temperature of 30 °C. The a.c conductivity, was analyzed depending of the universal power law proposed by Jonsher, .The slope of the relation between logarithm of a.c conductivity and angular frequency represent the s value were in the range (0.44-0.77) which found to increase by increasing of zinc oxide content which coincided with the small polaron (SP) model. The dielectric constant ε_1 and dialectic loss ε_2 where found to show progressive increase by increasing of zinc oxide content. The a.c conductivity showed exponential dependence upon angular frequency for the samples with low zinc oxide content while the conductivity was frequency dependent in the low frequency range by was frequency independent in the high frequency range .

Keywords : a.c conductivity , dielectric constant, $(La_2O_3)_{1-x}(ZnO)_x$

Study the Optical Properties of ($C_{52}H_{54}N_4O_{12}$) Dye

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Abstract:

This paper includes investigation of linear optical properties for malachite green oxalate (M.G.O) dye melted in ethanol solvent at several concentrates (2×10^{-5}, 1×10^{-5}, 5×10^{-6})Ml and for (M.G.O) dye films and optical properties of (M.G.O) dye films prepared by casting method for concentrate solution10^{-3} Ml. Measurement result using (UV-Vis) spectrophotometer to measure (absorbance, transmittance, absorption coefficient ($\alpha_\circ$), refractive index($n_\circ$) and energy gap) were found two transitions wavelengths (428,622) nm when dye is dissolved in ethanol and(435,646) nm when preparing films. Linear optical properties were studied for the three concentrations and it was found increased absorption coefficients and refractive index by rising concentration.

Key words. Malachite green oxalate dye ($C_{52}H_{54}N_4O_{12}$), Liner optical properties, Laser dyes.

Study of Some AC Electrical Properties of the AL/AgI/AL Junction

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Abstract

Investigation in the AC conductivity of the solid electrolyte AgI in the structure Al/AgI/Al that prepared as thin film have been presented. The results show that the conductivity increases with frequency, while the capacitance and the permittivity is nearly constant at high frequency but change significantly at low frequency. Interpretations of the results have been presented by proposing an equivalent circuit and deriving its corresponding theoretical equations that fit our experimental data.

Keywords: AgI thin films; Thermal evaporation; Complex conductivity; Capacitance; Dielectric constant.

Assessment of radioactivity and radiological hazards in some flooring materials used in Karbala governorate, Iraq.

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Abstract

The radioactivity concentrations of ^{40}K, ^{232}Th and ^{238}U in 20 specimens of commercial flooring materials used in Karbala governorate, were measured using (HPGe) system. The results of measurements have shown that highest value of specific activity of for ^{238}U which was 294.570Bq/kg (granite; Vietnamese origin), ^{232}Th which was 88.808Bq/kg (granite; Italian origin) and ^{40}K which was 284.580Bq/kg (marbles; Iranian origin), which were less than the worldwide average (UNSCEAR,2000). The various hazard indices were also calculated to assess the radiation hazard. It was found that none of the results exceed the recommended limit value. All specimens in this paper are within the recommended safety limit and do not present huge radiation dangers..

Keyword: Radiation hazard indices, flooring materials, (HPGe) detector.

The Effect of Sintering Temperature on the Electrical Properties and Particle Size of the Compound Ferroelectric PZT Prepared by Wet Chemical Methods

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Abstract

Lead Zirconate Titanate (PZT) nanopowder of ratio 35/65 $(Pb(Zr_{0.35}Ti_{0.65})O_3$ is prepared by one of the most wet-chemical routes called Sol-Gel Processing Method. The Lead Zirconate Titanate (PZT) is prepared from Lead Acetate and Zirconate (IV) isopropoxide as a source of metals. The acetic acid can be used as a solvent, and 2-methoxy was used as a stabilizer for Titanate (IV) isoproxide. The heat-treated powders at different sintering temperatures are characterized using the XRD diffraction technique, SEM, and LCR meter. XRD pattern shows the tetragonal phase of 35/65 Zr/Ti composition. They exhibited high density which is slightly different from the theoretical density, decrease of voids, stoichiometric chemical material, and homogeneity from both physical and chemical material. It has been found that each ceramic sample was exhibited different particles size depending on sintering temperature. The present work is well-crystallized with nanoparticles and single-phase perovskite PZT powders that can be obtained after heat treatment above 550°C for two hours. The dependence of this crystallization temperature is observed on the preparation condition. Lattice constant distortion is realized on dielectric constant, especially on the tetragonal phase.

Keywords: piezoceramics materials, sol-gel, PZT, Curie temperature, dielectric properties

Study the contamination of Radioactivity levels of ^{226}Ra, ^{232}Th and ^{40}K in (water)Iraq and their potential radiological risk to human population

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Abstract
In this study, the level of natural radioactivity in the banks of the Euphrates River was evaluated of four sites for the passage of the Euphrates(Al Kufa , Abu Sukhair, Al Mishkhab and Al Qadisiyah) , as samples were collected along the Euphrates River within the province of Najaf. The radioactivity of naturally formed radioactive materials of Uranium-238 and Thorium-232 series soluble strands in addition to the Potassium -40 radioisotope was determined using the NaI (Tl) sodium iodide reagent system (3"x3"). The values of normal radioactivity were measured in units (Bq.L^{-1}). Where was The concentration ranged from 16.44 to 143.88 (Bq.L^{-1})for ^{40}K ,0.90 to 6.16 (Bq.L^{-1}) for ^{238}U and 1.17 to 5.29 (Bq.L^{-1}) for ^{232}Th.The radium equivalent activity was below the defined limit of 370 (Bq.L^{-1}),the calculated exterior hazard indices had been determined to be much less than (one) from the results. Therefore that can be considered as database of these rivers in the future. Also we calculated that the average committed effective dose by ingestion of water for a typical adult was found to be 0.269 mSv.y^{-1} note that the average internal dose of 290 μSv.y^{-1} measured by the Scientific Committee of the United Nations on the Effects of Radiation for food and water consumption .finally we found out Excess lifetime cancer risk is 0.672*10^{-3} which is significantly less than the ICRP cancer risk of 2.5 $\times 10^{-3}$ which mean that the samples are safe healthy.

Keywords: NaI(TI) , Gamma spectrometry, Euphrates ,Water, Iraq.

Plasma Diagnostics and Characterizations of Reactive Magnetron Sputtered Copper Nitride Thin Films

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Abstract:

The plasma diagnostics of dc magnetron reactive sputtered copper nitride thin films by Optical emission spectrometer (OES) is investigated and argon / nitrogen effect (Ar /N_2) mixture ratio on plasma parameters and structural properties of sputtered Cu_3N thin films are discussed. Cu_3N thin films of 60.30 nm and 105 nm have been formed on glass substrates at room temperature using $Ar(70)/N_2(30)$ and $Ar(50)/N_2(50)$ working gas discharges respectively. The size of crystallites ,grains and particles in the copper nitride thin films have been estimated from X-ray diffractions ,Atomic Force Microscope (AFM) ,and Field Emission Scanning microscope (FESEM) respectively . The properties of sputtered copper nitride thin films are related to the plasma parameter of electrons temperature and density. . An increase in optical transmittance and a decrease in absorbance over the wavelength range were found as the nitrogen percentage increased which result on decrease the film thicknesses. The energy of the optical band gap, E_g obtained in the range of 2.6 to 2.7 eV.

Keywords: DC-magnetron sputtering, Optical emission spectroscopy, (CuN₃) cooper nitride,

Structural properties

Theoretical and experimental studies for different compounds to calculate: electronic transfer, energy gap and NLO properties

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Abstract

This work involves theoretical and experimental studies for seven compounds to calculate the electrons spectrum and NLO properties. The theoretical study is done by employing the Time Depending Density Functional Theory TD-DFT and B3LYP/high basis set 6-311++G (2d,2p), using Gaussian program 09. Experimental study by UV/VIS spectrophotometer device to prove the theoretical study. Theoretical and experimental results were applicable in spectrum and energy gap values, in addition to convergence theoretically the energy gap results from $\Delta E_{HOMO-LUMO}$ and UV/VIS. spectrum. Consider the theoretical method very appropriate to compounds that absorb in vacuum UV.

Keywords: TD-DFT, UV-VIS, NLO, Eg

SnO$_2$ doped In$_2$O$_3$ thin films as reducing gas sensors

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Summery : This research includes description of the x-ray diffraction , morphology and sensing measurements of SnO$_2$ doped In$_2$O$_3$ thin films synthesized by pulsed laser deposition method on glass and silicon wafer substrates . In2O3:SnO2 powders were obtained by mixing In2O3 with SnO2 in the desired ratio , and calcination the at temperature 1273 K for 5 hours . SnO$_2$ doped In$_2$O$_3$ thin films with different ratios (0, 0.01, 0.03 , 0.05 , 0.07, and 0.09% wt.) were prepared using pulsed laser deposition method . The structural investigation using X-ray diffraction revealed that the main peaks were compatible with the slandered cards of indium oxide and indium tin oxide .Atomic force microscope declared reduction of grain size by increasing of tin oxide ratio. The research imply details of samples preparation , experimental methods and results which are given and explained .In2O3:SnO2 /n-Si film NH$_3$ sensors were fabricated . The doping ratio that gave the highest sensitivity for NH$_3$was 5% wt.SnO2. SnO$_2$ doped In$_2$O$_3$ thin films was found sensitive against NH$_3$ at the working temperature 473K. The results showed that the sensors based on In2O3:SnO2 films revealed very short response time(13.5s) to NH$_3$ at 3% SnO$_2$ ratio at473Kworking temperature .

Keywords: NH$_3$ gas sensor, indium oxide; tin dioxide

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Carbon ratio effect on the electrical and morphological properties of Silicon Carbide thin films

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Abstract

An experimental method for preparing a homogenous mixture of Silicon Carbide by a small quantity of concentrated sulfuric acid at room temperature was introduced. SiC film exhibits an amorphous state due to acidic treatment that etches the crystalline surface of the film. SiC films were characterized using FTIR, SEM and optical images. SiC films porosity has been observed by SEM images show the morphology of the final composite. Electrical conductivity of thin films have been evaluated by four point probe Hall measurements. The best ratio of 6Si:4C demonstrated the highest conductivity 0.55 µS.cm.

Physical and biological synthesis of GNPs and keratin nanoparticles from chicken's feather and applications

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ABSTRACT: In this paper, we aim to synthesize keratin nanoparticles from chicken's feather. Crude keratin was extracted by chemical method. We obtained results for keratin nanoparticles using glutaraldehyde as a cross-linking agent. In this study, gold nanoparticles (GNps prepared by way Laser Ablation) with keratin nanoparticles for the production of antibacterial materials. NPs samples were characterized using a Transmission Electron Microscope (TEM). The absorption spectra were measure by UV-Visible, double beam spectrophotometer. Three types of pathogenic bacteria were used in this study (Pseudomonas aeruginosa, Staphylococcus aureus, and E. coli) in addition to one opportunistic yeast (Candida albicans). Nano-creatine particles can be used for wound dressing as well as cosmetic preparation.

Keywords: chicken's feather, Laser Ablation, Keratin nanoparticles, GNps Pseudomonas, Glutaraldehyde

Preparation Tio$_2$ and Zno/Tio$_2$ nanocomposites locally and use against Staphylococcus aureus

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Abstract

Enhancement antibacterial activities of a nanocomposit metal oxide by modifying the energy band gap are a future of anti-bacterial and viruses. (TiO$_2$ and ZnO/TiO$_2$) nanocomposit (NC) were prepared using a simple Sol-Gel method at calcination temperature 400, 500, 600, and 700 C. The structure, morphology and optical properties were utilized using X-ray diffraction (XRD), Fourier transmission infrared (FTIR), and UV-Vis spectroscopy. Antibacterial activity was measured according to the Kirby-Bauer disc method against Staphylococcus aureus .XRD patterns and FTIR confirmed the presence of TiO$_2$, ZnO nanoparticles (NP) without any change in the main peaks. FESEM pictures illustrated like a spherical shape for all that NCs samples especially at temperature 600 C with an average particle size less than 66nm. UV-Vis spectra showed a shift of absorption edges to a visible region. TiO$_2$/ ZnO NPs showed increase the antibacterial activity against bacteria strains Staphylococcus aureus. That enhancement of the NCs activity might pave the road to significant medical invention in the future.

Keywords: nanocomposit metal Oxide, , TiO$_2$, anti-bacterial, Staphylococcus aureus, Sol-Gel.

Determination the concentration of heavy elements and gross alpha, beta, and gamma activities in soil samples from Tworeach district at Karbala governorate

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Abstract. In this study, the radiological efficacy of selected samples of a hole produced by a rocket dropped during military operations in the second Gulf battle was measured. Since the fall of the rocket in 1991 on district of Tuwayrej, Karbala at central Iraq until this moment, there have been many miscarriages in women as well as cases of congenital malformation in children. For these reasons and in response to the appeals of the residents of the region, we conducted this study. Twelve different samples of soil were collected for the study area from different distances (0, 25, 50 and 100 m) and with different directions (North, South, East and West) from the edge of the hole. chemical method to calculate the percentage elements (Na, Cr, Ni, Ca, Fe, K, and Mg), in this samples, and using physical method to calculate the concentration of the natural radioactivity in the same samples the instrumentations used to count the gross alpha, beta, activities was alpha/beta proportional counter and High purity Germanium detector to calculate the gross gamma activity to count the radiation from these samples. The obtained results show that the gross alpha, beta and gamma activities ranged from (2.15 to 36.23Bq/Kg), (37.37 to 217.17Bq/Kg) and (2.26 to 50.92 Bq/Kg) respectively. In comparing the practical results with the global calculated results, the radiation levels of the studied models were found to be within permissible limits.

Keywords: Gross Alpha, Gross beta, Gross gamma, soil and radioactivity.

Nickel Oxide Thin Films Grooved by Laser Processing

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Abstract. Nickelous oxide thin films were successfully deposited onto glass substrates via a fully computerized system of Spray pyrolysis technique. The substrate was maintained at 350°C. Dichloronickel tetrahydrate was used as the raw chemical material. XRD investigation revealed a cubic phase of NiO crystal structure. XRD diffraction patterns were found peaks at $2\theta = 37.280°$, $43.297°$, 62.916 and $79.542°$, respectively The FTIR certified vibration mode of Ni-O bonds. Debye-Scherrer's formula found out the grains at 21 nm. Absorption spectrum recorded in the wavelength range of 350-850 nm. Morphology of NiO films was uniformly coated with good surface distribution. The fabricated film was grooved by a blue laser source of 500mW power. Laser grooving process produced a groove width of about 34 μm.

Keywords: Fully computerized Spray pyrolysis, NiO, Laser grooving.

Optical Properties Study of Polypyrrole doped with TiO2,WO3,Fe2O3 and SnO2 Nanoparticles

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Abstract

The study involves the synthesis of PPy and PPy loaded with various metal oxides TiO2, WO3, Fe2O3, and SnO2 with different ratios by polymerization procedure. The UV-Visible analysis was carried in the wavelength range (300-1100nm) to determine the optical parameters like optical energy gap and optical constants. From the analysis of absorption spectra, the band gaps of polypyrrole undoped are 1.85eV While the samples of PPy/SnO2 composite gained the highest values 2.2eV at weight Percentage (5%) but with PPy/Fe2O3 gained lowest values 1.5eV at weight Percentage (1%).

Keywords: Polypyrrole, Polymerization, Metal Oxides, UV-Visible, optical constants

Enhanced Performance of White Light Generation from ZnS /ZnO Core/Shell Nanocrystals

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Abstract. Zinc sulfide (ZnS) and zinc oxide (ZnO) nanocrystals (NCs) were synthesized to arrangement the ZnS / ZnO core / shell NCs via chemical reaction afterward produced from nanocomposite. The modified development of ZnS / ZnO NCs and the sulfurization and oxidation ecosystems could detect many external appearance and colors. Photoluminescence (PL) was analyzed to determine the properties and optical features of such nanostructures, as well as the energy gap between chemical bands. In addition, material characterizations verified, take in electron microscopy scanning and X-ray diffraction a first rising ZnS/ZnO core / shell nanocrystals. An absorption spectrum of ZnO shells on ZnS cores NCs was limited to development technique. The prepared nanocomposites seemed to have the results of scanning electron microscopy (SEM) and uniform in size limited within 3-4 nm radius. The core / shell nanocomposites ZnS / ZnO NCs are capable of generating white light uses. The white light emission was accomplished by illumination the UV-LED (GaN) nanocomposites of the core ZnS and ZnO cover NC.

Keyword: ZnS, ZnO, ZnS/ZnO, NCs, Core/Shell, White Light

Effect of addition on the structure and magnetic properties of $Ni_{1-x}A_x Fe_2O_4$ prepared via sol-gel method

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Abstract

The $Ni_{1-x}A_x Fe_2O_4$ (A=Co, Mg; x= 0, 0.5) spinal ferrite were compact in chemical "sol-gel" process. The structure and magnetic properties of the samples were done by XRD and VSM. The heat treatment for the samples was performed at 700℃ for 2 hours. The crystalline size of $NiFe_2O_4$, $Ni_{0.5}Co_{0.5} Fe_2O_4$ and $Ni_{0.5}Mg_{0.5} Fe_2O_4$ were 34.7 nm, 26.8 nm and 29.8 nm, respectively and magnetic measurements showed that the saturation magnetization of these materials were 48.1 emu/g, 34.4 emu/g and 20.36 emu/g, respectively. The values of coercivity (H_c) of the $Ni Fe_2O_4$, $Ni_{0.5}Mg_{0.5} Fe_2O_4$ and $Ni_{0.5}Mg_{0.5} Fe_2O_4$ are 182 Oe, 460 Oe and 85Oe.

Coupled-channel calculations for fusion reactions of ^{6}Li+^{64}Ni, ^{40}Ca+^{96}Zr and ^{124}Sn+^{48}Ca Systems

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Abstract: A coupled-channel calculations has been performed to study the cross-section of fusion σ_{fus} and the distribution of fusion-barrier D_{fus} and the fusion probability P_{fus} for the systems ^{6}Li+^{64}Ni, ^{40}Ca+^{96}Zr and ^{124}Sn+^{48}Ca by using the semiclassical method and Wong formula. The adopted semiclassical approach is mainly used for the treatment of the Coulomb excitation of the nucleus. The fusion barrier distribution is determined for both experimental and theoretical using the difference between three-points method. Theoretical results were compared with the measured data and shows very good agreement for ^{6}Li+^{64}Ni and ^{124}Sn+^{48}Ca systems, while for the system ^{40}Ca+^{96}Zr the results were not agreed below and above the Coulomb barrier V_b.

Keywords: Coupled-channels, Fusion cross section, Fusion barrier distribution, Wong formula, Fusion reaction.

Digital Analytical Study toward Air Pollution Effect Upon an Absorption Spectrum for Different Color Pigments

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ABSTRACT

In urban centers, particulate matter and gaseous emissions as pollutant emissions from industries and auto exhausts are responsible for rising discomfort, increasing airway diseases and deterioration of artistic and cultural patrimony. The presented paper concerns with such topic; smoke effect inside a system designed for this purpose. In such system, a burning incense is used as a source for smoke emission to study its effect upon the absorption spectrum for an ink with different pigments. Results show an evidence to the concept of wavelength absorption/reflection attitude for an ink; ink absorbs the appropriate wavelengths to give rise the required color. The latter evidence is true for all colors expect for white/black pigments. The later pigments have identical curved lines for Red, Green, and Blue bands with a trough (high reflectivity)/peak (high absorption) respectively.

Preparation and fabrication of (Mg,Sn) doped CdO/PSi solar cell by laser induced plasma

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Abstract

The cadmium oxide films containing both tin and magnesium (Mg, Sn) were deposited on the p-type porous silicon bases at room temperature (300k) with pulsed laser sedimentation technology (PLD). The characteristics of the manufactured cells were studied, which include measuring short circuit current density (J_{SC}) and open circuit voltage (V_{OC}), where it was found that the highest value of short circuit current density was within (6.60mA / cm^2) and open circuit voltage (0.54v). It was found that the efficiency of the solar cell increases with an increase in the percentage of vaccination from (0.59) for pure materials to reach (1.76%) for (n-CdO1-x: Snx / P-PSi) and (1. 64%) with respect to films   (n-CdO$_{1-X}$: Mg$_X$ / P-PSi).

Keywords : n-CdO/p-Si , thin films , solar cell , I-V characteristics , C-V measurement

WATER QUALITY INDEX FOR SURFACE WATER ASSESSMENT BY USING GIS TECHNIQUES, AL- NAJAF, KUFA, IRAQ

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ABSTRACT

Our study achieved in AL-Najaf province within kufa district which are consist of stream network, in dry season (2016), there are thirteen samples collected and six physicochemical parameter analyzed in laboratory of environment in surface water and agriculture directorate in AL-Najaf Province. Six physicochemical parameter like Ec (mmho/cm), TDS(mg/liter), Ca^{+2}(mg/liter), Cl^-(mg/liter), $So4^{-2}$(mg/liter), and PH. For irrigation purpose Standards Iraq were used and inverse distance waited(IDW) interpolation has been used to make of six parameters spatial distribution map above. Raster calculator of Arc map GIS 10.2 software presented water quality index for surface water samples ranged between 53.5092 - 87.5235.

Key word: Water quality index , GIS, physicochemical parameters

Linear and Nonlinear optical properties of Rhodamine 6G

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Abstract

In this study, the linear and nonlinear optical properties of laser dye R6G in methanol solvent were investigated with various concentrations ($1x10^{-4}$, $5x10^{-4}$, $1x10^{-5}$, $1x10^{-6}$ and $5x10^{-6}$ mole/liter) at thickness (1mm). To study the non-linear optical properties like refractive index and absorption coefficient (β) Z-Scan technique was used in two modes, the first is the close aperture which can be done by putting the aperture in front of the detector to find the non-linear refractive index. While the second mode is the open aperture which can be obtained by removing the aperture to find non-linear absorption coefficient, using two-wavelength 532 and 1064 nm. The results show that all R6G dye concentrations exhibited self – focusing in closed aperture Z-scan in 532 nm except the ($1x10^{-4}$ mol/liter) in 1064 nm which shown a self-defocusing and the change of the effect of saturation absorption in an open aperture in both wavelength.

Key word: Rhodamine; nonlinear; Z-Scan;

High performance and efficiency enhancement for organic solar cell : layers thickness optimization

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Abstract

A mathematical modeling for performance and efficiency for organic solar cell is presented, bulk hetero-junction photovoltaic of ITO layer (indium tin oxide), P3HT (Poly3-Hexylphiophene) PCBM (phenyl C_{61}-butyric acid methyl ester) was investigated, the results show main effect of all layers thickness and a major effect for the active layer thickness of the electrical energy obtained for this OPV solar cell   due to open circuit voltage, fill factor and short circuit current for the OPV solar cell.

The efficiency investigation was done according to J-V curves obtained from GVPDM (General photovoltaic purpose device model) which built according to optical treatment and drift diffusion model based on the poisson's equation solution, we started from 1e-5 to 1e-9 meter thickness for each layer, then by taking optimum thickness for each layer which are about 1e-7 meter we investigate the efficiency for active layer thickness between (1e-7 to 9e-7), the efficiency obtained was about 3.7 to 2.7 respectively.

Key word: Organic solar cell, solar energy, OPV, GVPDM simulation program, solar efficiency.

Measurement of the natural radiological activity of soil samples of some general education schools in Al-Qadisiyah Governorate

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Abstract

Right now, specific radioactivity of soil chose from Diwaniya Governorate was estimated. Ten samples of this soil were gathered. These samples were from some general education schools, where the samples were taken from diversified sites. to define the specific activity from the radioactivity ^{232}Th, ^{238}U and ^{40}K, Iodide sodium system activated with Thallium 3"×3" had been used for this aim , finally for Thorium ^{232}Th ranged between (BLD-14.652) Bq.kg^{-1}, average (5.334) Bq.kg^{-1}. for Uranium ^{238}U, it is ranged between (BLD-26.187) Bq.kg^{-1}, average (8.364) Bq.kg^{-1}, where the result showed that radio activity of potassium ^{40}K ranged between (346.823-536.704) Bq.kg^{-1} with a rate of (450.482) Bq.kg^{-1}, The radium equivalent values ranged between (33.951-68.194) Bq.kg^{-1}, average (50.68) Bq.kg^{-1}, the absorbed dose rate in air ranged between (18.386- 33.995) nGy.h^{-1}, average (25.962) nGy.h^{-1}, External hazard index ranged through (0.091-0.184), average (0.136), Internal hazard index ranged through (0.091-0.226), average (0.159). activity concentration index ranged between (0.293-0.538), average (0.409), the observed results were below the International recommended limits.

Keywords: Radiation, Radioactive contamination, Na reagent (Tl), Effective annual dose.

Cancer Risk Assailments Due to Inhale Lead Fly Ash by People in Wasit Governorate – Iraq

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Abstract:
The concentration of the heavy metal lead (Pb) has been measured for more than one hundred indoor air samples of different locations in Wasit Governorate that is frequented by many people. The samples were taken from the air conditioners of these locations and then washed with distilled water. The Atomic Absorption Spectroscopy (AAS) has been used to measure Pb concentration. The results showed that the concentration of Pb, in general, is higher than the allowed international values. The minimum, maximum, and overall average values of Pb concentration (in $mg\ m^{-3}$) for the investigated samples were 5.29E-03, 2.72E-05 and 9.56E-04, respectively. Finally, the cancer toxic risks and non-cancer toxic risks have been estimated, and its results were important and cannot be ignored.

Characteristics of Dielectric Behavior of $Cu_{0.5}Ti_{0.5}Tb_xFe_{2-x}O_4$ Ferrites

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Abstract

$Cu_{0.5}Ti_{0.5}Tb_xFe_{2-x}O_4$ samples were prepared by powder technology at different values of x (0, 0.03, 0.06, and 0.09). The behavior of dielectric constant studied within frequency range (100 Hz - 10 MHz)) at different annealing temperatures (298, 373, and 473) K. This studying indicated a fine behavior for dielectric constant with frequency range and annealing temperatures. The study of dielectric loss (tan δ) showed reducing of relaxation time and appearing different loss peaks with the variation of frequency and temperature. Also the activation energy which is related to relaxation time is calculated.

Keywords: powder technology, frequency, temperatures, relaxation, compound, dielectric constant.

Plasma Diagnostics and Characterizations of Reactive Magnetron Sputtered Copper Nitride Thin Films

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Abstract:
The plasma diagnostics of dc magnetron reactive sputtered copper nitride thin films by Optical emission spectrometer (OES) is investigated and argon / nitrogen effect (Ar /N_2) mixture ratio on plasma parameters and structural properties of sputtered Cu_3N thin films are discussed. Cu_3N thin films of 60.30 nm and 105 nm have been formed on glass substrates at room temperature using Ar(70)/N_2(30) and Ar(50)/N_2(50)   working gas discharges respectively. The size of crystallites ,grains and particles in the copper nitride thin films have been estimated from X-ray diffractions ,Atomic Force Microscope (AFM) ,and Field Emission Scanning microscope (FESEM) respectively . The properties of sputtered copper nitride thin films are related to the plasma parameter of electrons temperature and density. . An increase in optical transmittance and a decrease in absorbance over the wavelength range were found as the nitrogen percentage increased which result on decrease the film thicknesses. The energy of the optical band gap, E_g obtained in the range of 2.6 to 2.7 eV.

Keywords: DC-magnetron sputtering, Optical emission spectroscopy, (CuN_3) cooper nitride,

Structural properties

Study the electrical properties of Sb Thin Films with effect of annealing temperature

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Abstract:

The electrical properties of the Sb films were studied with different annealing temperatures, these films were deposited on glass substrates at room temperature thermal evaporation technique with thickness (0.5 μm), all samples are annealed in a vacuum for one hour. the d.c conductivity for all deposited films decreases from 17.54×10^{-2} to 12.23×10^{-2} $(\Omega.cm)^{-1}$ with increase of annealing temperature form 373K to 473 K. Increasing of annealing temperature from 373K to 473K, caused the electrical activation energies Ea1 and Ea2 to increase from 0.014 to 0.021eV and from 0.026 to 0.033eV respectively. Hall measurements showed that all the films are p-type.

Keywords: The d.c conductivity of Sb, Electrical Properties of Sb, Hall measurements of Sb.

Enhancement the electronic and optical properties for the dye Disperse Orange 13 and using in the solar cell device

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Abstract: Disperse Orange 13 (DO13) is from the Azo dye group, its double azo class. It has a good photo-thermal stability dissolvability and easy preparation so that can be used in optoelectronic applications. In this study, three new dye structures group were designed by adding molecular of thiadiazol, thiophene and oxadiazole to DO13 molecular structure, respectively, to enhance the optical and electronic properties of disperse orange 13 azo dye. This study involves investigation and calculation of the optical and electronic properties. energy band gaps, absorption spectrum as a function to wavelengths, frontier orbital (the highest and lowest molecular; the first is occupied and the second is unoccupied orbital), maximum energy, Fermi energy levels, work functions are studied based on the first concepts of the density functional theory (DFT) calculations. The study results show an enhancement on optical and electronic properties of DO13 dye. Where the λ maximum values ranged from 454.670 to 496.760 nm, these values are within the visible light region, the absorption increasing from 0.693 for DO13 to 1.288 for DO13-3thiophene. According to all characteristics shown in the study, the new dyes group may be considered a promise material for solar cell applications.

Keywords: DFT; DO13; energy gap, Gaussian, solar cell

Bending Deformation on the electronic structure of the (3,3), (4,4), (5,0) and (6,0) single-wall carbon nanotubes

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ABSTRACT

In this work we investigate the effect of bending defect on the electronic and structural properties of the (3,3), (4,4), (5,0) and (6,0) single-wall carbon nanotubes (SWCNTs) using density functional theory (DFT) within Becke three parameter Lee–Yang–Parr (B3LYP) functional using 6-31 basis set. Our result revealed that as the bending angle increases, the deformation of atomic structure of the tube increases, particularly in the centralized zone of the tube. The obtained outcomes revealed that the bandgap fluctuates with the bending angle of CNTs and the cohesive energy, the highest occupied (E_{HOMO}) and the lowest unoccupied molecular orbitals energies (E_{LUMO}) decrease (in magnitude) as the CNTs bending increases. On the other hand, the electron affinity and the ionization potential increases with the bending angle of CNTs, while the Fermi energy decreases with the bending angle of CNTs, with a fluctuation of Fermi energy with the bending for (4,4) tube. Finally, in the presence of bending deformation, the highest number of density of states in the valence and conduction bands decrease with increasing the bending angle of CNTs.

KEYWORDS: Carbon Nanotubes, B3LYP, Bending, Electronic Structure.

The effect of using Nano iron oxide in radiological shielding

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Abstract. In this study, some attenuation parameters of gamma shields were studied. This shields consisting of composite materials of Unsaturated polyester as a base material and Nano iron oxide (Fe_2O_3) and , micro iron (Fe) as reinforcement materials at different percentages (1, 3,5,7and 9)wt%, and with different thickness (1, 1.5, 2, 2.5, 3, 3.5and 4) cm. The results showed that the use of nanoparticles is better than the microparticales in the field of radiation shielding. It has been shown that the values of attenuation parameters of gamma it bitter in the case of nanoparticles than case of the use of micro material.

Keywords: Nano material, Linear Attenuation coefficient, buildup factor.

Theoretical Investigation of New Organic Compounds (D-π-A) Based on Triphenylamine as Photosensitizer for Dye-sensitized Solar Cells

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ABSTRACT

The current work involved suggestion of a new material "D-π-A system" for use in solar cells as organic dyes sensitized. The ground state estimations are done by utilizing the hybrid functional "B3LYP" with 6-311G(d, p) basis set on density functional theory (DFT) method in gas phase. Besides, the TD-DFT was selected with same functional to modulate the electronic absorption spectra and charge-transfer capabilities of the dyes analyzed in this study. The effects of introducing different groups as π-bridge on the properties of these materials were examined with intending to confirm the connection between compounds structure and its properties. In addition, various electronic, optical, chemical reactivity and optical parameters were determined from the fully optimized structures. The results demonstrate these materials can be utilized as organic sensitizers for solar cell because of its properties and probability of the electron injection process from each studied molecule to the E_{CB} "conduction band" of TiO_2 and PCBM and the subsequent regeneration are possible, finally the electrons transfer will be simple from the examined dyes to TiO2 or PCBM.

Keywords: *organic dye-sensitized, π-bridge, DFT, chemical reactivity, optical parameters.*

Synthesis of ZnO:B thin films Dropped on Porous Silicon for H$_2$ Gas Sensing

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Abstract

Porous Silicon PS has been prepared so as to use it a substrate to dropped ZnO:B thin films with different boron concentrations additions (2- 8) % dropped at 450°C through used the chemical spray pyrolysis (CSP) technique in approximately 150nm thicknesses. Crystallite and Grain size decreases with adding more of boron as a doping for zinc oxide films which dropped on the negative type (n-type) and positive type (p-type) of PS. Surface morphology study for the obtained the ZnO:B thin films and for the n-PS and p-PS was studied by TEM, SEM and AFM. Sensing properties of ZnO:B thin films for H$_2$ gas showed that the increases of boron leads to increases of the thin films sensitivity, measured sensitivity of the n-PS substrate was more than p-PS.

Keywords: H$_2$ Gas sensor; porous silicon; thin films; ZnO:B.

Structural, morphological and optical properties of spray pyrolysis TiO$_2$:GO nano films

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Abstract

Thin films of pure and doped nano titanium dioxide (TiO$_2$) were prepared using a chemical pyrolysis technique (CPS), with different nanosize graphene oxide (GO) concentrations in the range (3-9)wt%. The structural, morphological and optical characteristics of these films were investigated. X-ray diffraction (XRD) technique measurements revealed that the structure properties of TiO$_2$ have polycrystalline structure with anatase phase. AFM analysis showed the grain size of TiO$_2$ films with different concentrations was decreased after doping with high concentration of GO ratio. Roughness of these films decreased too after adding of GO impurity for all films from (7.65-5.6)nm except 5wt% percentage where increased to 13.7nm. Optical
properties of TiO$_2$ are affected by stimulants of GO, where the refractive index and the real part dielectric constant decrease, while the extinction coefficient and the imaginary dielectric constant increase after continuous addition of GO up to 7wt% and then increases with an increase in the further percentage of impurities. Energy gap values decreased after doping up to 7wt% with GO where the values lies in the range was 3.31 to 3.2eV while arrived to 3.49eV with more increasing of impurity percentage.

Keywords: TiO$_2$ metal oxide, GO graphene oxide, structure, morphological and Optical properties.

Measurement the Radiation Absorbed Dose Rate in Some Schools of Wasit Governorate – Iraq

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Abstract:

In this paper, twenty four measurements for radiation absorbed dose rate (D) of selected schools in Wasit Governorate – Iraq have been investigated using Canberra dosimeter. The annual radiation effective dose rate (Eff.D) has been calculated for all investigated schools. The results showed a significant fluctuation for all measurements of indoor and outdoor absorbed dose rates (D_{In} and D_{Out}) and the overall average values were 0.14 µSv/h and 0.134 µSv/h for D_{In} and D_{Out}, receptively. Furthermore, the maximum value of Eff.D was 1.275 mSv/y and the minimum value was 0.294 mSv/y while the overall average value was 0.819 mSv/y.

Keywords: Absorbed Dose Rate; Natural Radiation; Annual Radiation Effective Dose; Wasit-Iraq

The Morphology and Electrical Characterization for external doping (POT)

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Abstract: In this work, Poly (o-toluidine) have been Built up by oxidizing polymerization (o-toluidine) in an acid medium. The polymer was distinguished by emissions by EDX, SEM, and the electron. external doping has been used. N-methyl-2-pyrrolidone (NMP) is a solvent used in a thin-film mixture. Two-probe methods have been used in the measurement of electrical conductivity. The effect of different temperatures on conductivity has been studied. We find low conductivity about $0.0202*10^{-4}$ S/cm.

Keywords: Poly (o-toluidine), Electrical and Optical characterization, external doping.

Measurement of Radioactive Potassium-40 to Specify Potassium Element in Wheat and Its Derivatives for Wasit Governorate – Iraq

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Abstract. The total potassium (element) concentration in percentage ratio (K%) has been calculated for wheat and its derivatives (wheat flour, bran, yeast samples) of Wasit mills, and wheat flour samples that used in bakeries distributed in Wasit governorate by measured K-40 radioactive isotope using gamma spectroscopy adopted with high pure germanium coaxial detector. The overall average values of the above investigated samples were; 0.190%, 0.159%, 0.122%, 0.111%, and 0.251%, respectively. In addition, the natural occurring radioactive materials for all samples have been investigated. Except potassium – 40 (K-40), all the measured radioactive isotopes were below the minimum detectable activity of gamma spectroscopy, therefore, even if a more accurate measurement system is used, the specific radioactivity (S.A) of these isotopes are within the international permissible levels. Then, the ingested radiation annual effective dose of the intake K-40 (Eff D) has been calculated, and the results showed that all values within the international allowed values.
Keywords: Potassium; Radioactivity; Wheat; Flour; Bran; Wasit; Mills; Bakeries
Abstract:

Measuring Laser Beam Transmission through Exposed/Etched CN-85 Detectors

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Abstract

Cellulose Nitrate (CN-85) plastic detectors, with a thickness of 100 μm, were exposed to radiation by alpha particles. Then, the irradiated detectors were etched and treated with radiation by using He-Ne laser source. The influence of laser irradiation on the physical characterization of CN-85 track detectors has been investigated through track radii. In this study, the tracks' number and track radii were calculated. The results showed that the track radii of laser-etched CN-85 detectors were reduced with increasing the etching time. Further, the track radii were changed due to the effects of alpha particles on the CN-85 detectors. This method is found to be a relatively inexpensive, easy, and effective tool for measuring the radiation dose.

Keywords: CN-85; alpha particles; laser beam; NTD; etching time.

Phenomenological Description of $^{130,\ 131}$Ba Isotopes

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Abstract: The phenomenological description of Barium isotopes with proton number Z=56 and neutron numbers (n) between 74 and 75 have been studied through the interacting boson-fermion model. Energy levels and B(E2) transitions have been calculated. The set of parameters used in this calculation is the best approximation that has been carried out so far. Good agreement was found from comparison between the calculated energy levels and the transition probabilities B(E2) with those of experimental.

Keywords: Interacting Boson-Fermion Model, Ba isotopes, Energy levels, Positive parity, B(E2).

Stability Analysis and Bifurcation in External Cavity Quantum Dot Semiconductor Laser

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Abstract. A simplified mathematical model to describe the nonlinear dynamics of a quantum dot laser (QDLs) coupled with external cavity was modified. This system is currently modeled by very complex equations which are intractable analytically and numerically. The model derived is simple, and efficient to provide full insight of the dynamics of the QDLs while compared with the well-known classical models. The equilibrium points and stability analysis of critical points is carried out. Various bifurcation scenarios are obtained numerically showing several striking routes to chaos.

Keywords: QDLs, stability, bifurcation, chaos, coexisting behavior.

Estimated of U, Rn and Po Concentrations in Smokers Blood Samples Collected from Babylon, Iraq

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A B S T R A C T
Because of the greats pressures on humans, there are resorted to smoking without knowing its effects on health. Such symptoms include adult lung cancer, cardiovascular, respiratory infections, kidney failure, congenital abnormalities and chronic bronchitis. Uranium and radon estimation has carried out in 100 smoker and Non-smoker blood samples from Babylon, Iraq, using solid state nuclear track detector (CR-39). The results have been shown the total uranium concentrations in blood smokers and non-smokers samples to be 1.02 ± 0.26 ppb and 0.86 ± 0.17 ppb respectively. On the other side, the total concentrations of radon in blood smokers and non-smokers samples 4.98 ± 0.79 Bqm^{-3} and 3.59 ± 0.28 Bqm^{-3} respectively. The total concentrations of uranium and radon in blood samples of smokers are greater than non- smokers blood samples. While, the total polonium (POW) and (POS) for smoker and non- smoker samples to be 0.527 $KBqm^{-3}$ - 0.127 $KBqm^{-3}$ and from 0.378 $KBqm^{-3}$ to 0.091 KBqm−3 respectively. These studies conclude the smoking causes an increase in the concentration of uranium and radon and polonium in the blood of smokers.

Efficiency of TiO_2/Peroviskites/Cu_2O Solar Cells with Optimal Thickness at Varying of Environment Temperature

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Abstract

Perovskite solar cells become another field for conventional solar cells achieving an output of 22.1 percent in eight years (2008-2016) short period. There is reason to believe that PSCs are a strong competitor in the photovoltaic field with silicone and CIGS solar cells. The well understanding of the operation mechanism of PSCs is essential and mandatory to furtherly improve device performance. The shape and excitation type is like to inorganic semiconductor solar cells. This work is concerned about the design and studies of lead-based perovskite solar cell model with the flexible architecture of ITO/TiO_2/$CH_3NH_3PbI_3$/Cu_2O/Au and analyzed using the solar cell capacitance simulator (SCAPS-1D), we study the effects of the thicknesses for all active materials which are ETM, HTM and Perovskites in addition to environment temperature on the main parameters of our device solar cells. **Method/Analysis:** Solar cell device assessment is conducted using a Solar Cell Power Simulator(SCAPS). This is a computer-based software tool and is well equipped to conduct research into photovoltaic structures with barriers to homo and heterojunctions, multi-junctions, and Schottky. This model optimizes various parameters such as the thickness, Electron Transport Material (ETM) (ND and NA) doping concentrations, and Hole Transport Material (HTM). Achievement and simulates electrons and holes based on the Poisson's and continuity equation The effected thickness of CH3 NH3 PbI3 different from 0.2µm to 1µm and the finest results are observed at 0.2µm. **Improvements**: Efficiency is constant at different temperatures when using the finest thickness for the material where the efficiency reached 21%.

The optical spectrum of Aluminum nanoparticles prepared by a laser ablation technique in the liquid

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Abstract:

This is research were study an effect of changing an energy of laser and study of an optical properties from aluminum nanoparticle (NPs) processe by a laser ablation technique is present in deionized a water. The results showed absorption at the wavelength 225 and 223 (nm) and increase in absorption with energy because increase in density and number of particles.

Keywords. Pulsed laser ablation, Aluminum nanoparticles, colloidal nanoparticles , Optical Absorbance .

Effect of annealing temperature on structure and optical properties of CdO nanocrystaline thin film prepare by chemical bath deposition method

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Abstract

CdO thin film has been deposited by chemical bath deposition method (CBD) on the glass substrate. Effect of annealing temperature(573,623 and 673 K) on the structural and optical properties of the films has been investigated. The crystal structure investigated by X-ray diffraction method. Annealed CdO films are polycrystalline in nature with cubic structure having a preferential orientation along (1 1 1) plane. Analysis of XRD indicates that the intensities of peaks of the crystalline phase have increased with the increasing of annealing temperature. The structural parameters for the CdO thin films as the grain size, strain, dislocation density, and texture coefficient were calculated. Particle size for the preferential orientation at different annealing temperature is (16.95, 18.24 nm) for annealing temperature 623 and 673 K respectively. Optical properties study of CdO thin films using UV-vis spectrophotometer shows blue shift in the energy band gap as an indication of quantum confinement. It is observed that the band gap energy decreases with increasing of annealing temperature. The direct and indirect band gap energy values were found to be (2.95 2.87) and (1.945,1.914) eV respectively.

Keywords ; CdO thin film, chemical bath deposition method ,annealing, structure properties and optical properties

Materials recognition based on electromagnetic metamaterial absorber

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Abstract. In this study, squire ring resonator structure (SRR), which can be used as an materials sensor based on electromagnetic metamaterials absorber in microwave S-band regime. The SRR is contain squire copper ring and hole on the top, FR4 in the middle layer and copper film at the bottom. The sensitivity of the resonance frequency to the material type was numerically examined in the CST Microwave Studio (MWS) environment. In these analyzes, the hole dielectric constant of material was changed from 4.3 to 1. Within the three different materials (FR4, oil and vacuum). It is shown that the absorption wavelength displays worthy blue-shift with the increasing dielectric constant of material. Furthermore, the simulation results indicate that the sensitivity of SRR is very good, which makes SRR structure be an ideal detection for material type..

Assessment CO2 Emission Intensity of Crude Oil Production in Iraq

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Abstract

Carbon Dioxide Emissions Intensity (CDEI) in Iraq correlated between carbon dioxide emission (kg CO_2) and crude oil production (COP) (kg oil equivalent). This relationship is important for industry and energy sectors to the achievement of their economic and environmental goal, then to know a common pattern of emissions intensity. The sources of data set from Carbon Dioxide Information analysis center (CDIAC), contain: total CO2 emission , COP from Iraqi Ministry of oil and Iraqi crude oil production increased over time and about (more than 80%) from Basra city. Environmental Kuznets Curve (EKC) was calculated.

CDEI was nonlinear behavior that high level in the 1970s then decreased to reach 1.707 kg co2 / kg $_{oil\ equivalent}$ in 1997, and CDEI was more sensitive to COP than total CO2 emissions. EKC maximum values present in early 1970s and in 2004 present highest value was (0.082 metric ton / current US$ person). COP was unstable level, fluctuation between (1-3) mb/d, till reach 4.29 mb/d as average in 2019.

Keywords: Carbon dioxide emission intensity, Crude Oil production, EKC

Classification of Optical Images of Cervical Lymph Node Cells

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Abstract: the study considers the optical classification of cervical nodal lymph cells and is based on research into the development of a Computer Aid Diagnosis (CAD) to detect the malignancy cases of diseases. We consider 2 sets of features one of them is the statistical features; included Mode, Median, Mean, Standard Deviation and Maximum Probability Density and the second set are the features that consist of Euclidian geometrical features like the Object Perimeter, Area and Infill Coefficient. The segmentation method is based on following up the cell and its background regions as ranges in the minimum-maximum of pixel values. The decision making approach is based on applying of Minimum Distance which give accuracy of 97%.

Keywords: lymph node cells, segmentation, minimum distance, optical imaging.

FTIR- Spectrum of Zinc nanoparticle by Laser ablation technique in liquid

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Abstract:

In this research zinc nanoparticles metal were prepared by laser ablation method using zinc novel metal. The Zn nanoparticles were characterized by Fourier transform infrared (FTIR) .The optical properties of particles were studied an FTIR spectrum . FTIR spectra confirmed the adsorption of surfactant molecules at the surface of Zn nanoparticles and presence of Zn bonding. The result reported increase in wavenumber with energy supplied and reduce in transmittance.

Keywords. Pulsed laser ablation, Zinc nanoparticles, FTIR spectrum

Al- Doped Graphene as a Sensor for Toxic Gases Using The Density Functional Theory

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Abstract-   The electronic properties of the C35Al molecule grapheme sheet was meant to be examined by conducting the study in hand in addition to those accumulation of C35Al over other toxic gases molecules, namely CO and H2S, through the application of DFT, which is the Density Functional Theory. Going through a systematic study, both of the geometrical structure and the electronic characteristics possessed by the doped grapheme molecules were compared to the pristine grapheme C36 after being thoroughly examined. A number of functionalized and dodecahedral derivatives were studied at the B3LYP that is functional and basis 6-31G. After examining a number of functionalized and dodecahedral derivatives at the B3LYP that is considered functional as well as the basis set 6- 31G(d,p) level of the (DFT), which is the Density Functional Theory. After that, as the energies, relative and formative, of the compounds, occupancy, the greatest molecular orbit that is occupied (HOMO) as well as the smallest molecular orbit that is unoccupied LUMO), the gap between the energies (LUMO - HOMO) was calculated. As the Co and the H2S possess adsorption characteristics that appears at the graphene sheet surface (C35Al), these characteristics were also studied by DFT. Furthermore, the apparent and possible chemical properties or the Fermi energy that the graphene sheet (C35Al) has as well as the molecules of the gas were also studied. It was found that the energy values that are considered those of the adsorption characteristics of the gas molecule are condensed. Therefore, the sensor is going to go through periods of recovery. The results that were discovered were indicative of the fact that greater numbers of EHOMO in relation to the CO adsorption of the C35Al graphene sheet, which was (-7.1507 eV), displaying that the molecule is less likely to donate electrons as ELUMO value is smaller to the H2S adsorption of the C35Al sheet of graphene, which is (- 5.3358 eV). What these values illustrate is that the molecule is more likely to receive electrons as well as lesser rates of the adsorption of Eads H2S on the C35Al sheet of graphene is (0.2721 eV). These values show that a propensity of the molecule used as a sensor.
Keywords – graphene, gas adsorption, density functional theory, HOMO and LUMO.

Age-dependent changes in bone mineral density for males and females aged 10-80 years

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Abstract.

BACKGROUND: One of the most accurate and highly reproducible techniques is dual- energy x-ray absorptiometry (DXA). DXA device used to measure BMD, BMC, T-score, Z-score, and consequently used to measure fat mass (FM) and lean mass (LM) for different body sites such as arms, ribs, thoracic spine, lumbar spine, pelvis, legs and whole body. DXA technique is widely used in clinical application researches like diagnosing and treating osteoporosis in elderly men and women with different diseases and assessment of skeleton status.

METHODS: One hundred and seventy-six males and females participated in the current study consisting of 48 males and 128 females were evaluated by Dual Energy X-ray Absorptiometry (DXA)**.**

RESULTS: The estimated correlation coefficients values were as follows: total BMD depending on segmental BMD of arms, legs were fitted with correlation coefficient of (r=0.92) and (r=0.91) respectively; also it were fitted with (r=0.85), (r=0.84), (r=0.73), (r=0.70), and (r=0.65) for head, pelvis, ribs, thoracic spine and lumber spine respectively; p<0.0001.

CONCLUSION: The mean total bone mineral density BMD of the total body for both genders shows highly significant ;(p-value = 0.0001) through the ages (20-29). The same results are shown in the ages of (60-69) years with a significant relationship between males and females; (p= 0.01). All the other groups (10-19), (30-39), (40-49), (50-59) and (70-80) years showed no significant relationship between both genders, where all mean total BMD amounts were small in female subgroups; p>0.01.

KEYWORDS: Dual energy x-ray absorptiometry, bone mineral content, bone mineral density, T-score, Z-score.

Impact Rainfall on the Aerosols Optical Thickness over Selected Stations in Iraq

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Abstract. The Aerosols Optical Thickness (AOT) and rainfall are important factors in the physical processes that occur in the atmosphere, such as absorption and dispersion of solar radiation and precipitation composition, and thus affect the radiation balance and water balance in the atmosphere. The methods used in the study depend on the monthly and yearly mean of the aerosol and sum of rainfall, taken from the European Mediterranean Weather Forecast (ECMWF) during the time period (2008-2018), for selected stations in Iraq (Mosul, Baghdad, Rutba, Basra). The largest value of the aerosol index was recorded in Basra, and the lowest value was recorded in Mosul the highest value of rainfall recorded in Mosul, and the lowest value in Basra. The relationship between the aerosol index and rainfall is a ten-year inverse relationship for the selected areas (Mosul, Baghdad, Rutba, and Basra).

Keywords. Rainfall, AOT, Climate changes, ECMWF, Iraq.

Annual Committed Effective dose as a result of daily Consumption of Medicinal Herbs in Iraq

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Abstract. Knowledge Expertise of radioactivity levels in the human diet is very important to   estimating potential radiological risks to human health. During this research gamma ray spectroscopy technique was used to measure the awareness and amount of the annual effective dose (E_{ave}) due to Uranium, Thorium and Potassium and the lifetime risk factor for cancer (ELCR) in forty samples, of the most widely used medicinal herbs in Iraq and evaluation of ingested doses through herbs consumption, the estimated total annual effective dose received of Uranium, Thorium and Potassium due to the population's consumption of medicinal herbs ranges (0.0124-0.9632) with a mean (0.1502), (0.0024-5.7334) with a mean (0.4750), (0.8324-7.9970) with a mean (2.9349) in units (μSv/y) respectively, while the lifetime risk factor for cancer was ranges (0.0291-0.2798) with a mean (0.1026). All results indicate that they are within the permissible limits for medical and food use, and when comparing the results with IAEA publications and international and Arab research, it was found that they are significantly less than the permissible global range and therefore do not pose a threat to human health also can be considered as database of these herbs in the future.

Keywords: NORMs, herbs, Gamma spectroscopy, Iraq, ELCR.

Effect of Solvents on Linear Optical Properties for Nematic Liquid Crystals

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Abstract

In this work effect of solvents on linear optical properties for solutions of nematic liquid crystals dissolved in different solvents with different concentrations were investigated. Absorption and transmission spectra of this samples had been recorded using UV-VIS spectrophotometer. The results indicate that the samples dissolved in chloroform solvent possess very large linear optical properties as compared with samples dissolved in ethanol and methanol solvents. As a result it can be used as resonator cavity in liquid crystal lasers and other optical and photonic devices.

Key words: Liquid crystals, Linear optical properties, Solvent effect.

Effect of Solar radiation induced and alpha particles on Nonlinear behavior of PM-355 film

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Abstract: In the current work of radiology, polymeric sheets of the PM-355 nuclear track detectors (SSNTDs) were exposed with α-particles and solar radiation for several exposure times. The absorption spectrum of samples exposed to the sun showed that the edge of the absorption accidentally changed to longer wavelengths. An investigation of continue waveguide laser effects on the nonlinear absorption properties of nuclear track polymer has been done. Non-linear absorption increases with increasing levels of exposure to sunlight and is highly connected to revealed surface morphology and chemical structural modifications. In case of high solar radiation flux and α-particles irradiation, the nuclear track detectors showed high nonlinearities, represented by the appearance of a number of diffraction rings.

Keywords: PM-355 polymer; Alpha particles; Absorption edge; Laser; Solar radiation

Mixing two Organic Dyes to Improvement Solar Cell Efficiency

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ABSTRACT
The solar cell efficiency has been improved by using concentrators having mixing two organic dyes; Pyranine and Triglyceride for Oleic acid. The efficiency of the silicon solar cell was measured before and after mixing.
A Big improvement was noticed in the solar cell efficiency from (21.57) to (34.16). Also, the (fluorescence & absorption), stokes shift ($\Delta\eta$), radiated lifetime (τ_{fm}) , fluorescence lifetime (τ_f) and quantum efficiency (Q_{fm}) was calculated.

KEYWORDS: Solar cell, efficiency, fluorescence and quantum efficiency.

Patients effective dose estimation during AP pelvis radiography in some hospitals of Al Najaf city, Iraq

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Background: Monitoring patients radiation dose during anterior-posterior (AP) pelvis radiography is of paramount importance. This is due to the existence of the gonads within the pelvic region.

Objective: The purpose of this work is to estimate effective dose (ED) for adult patients who examined for AP pelvis radiography in the governmental hospitals of Al Najaf city-Iraq.

Materials and methods: The ED was estimated for 64 patients (male and female) who undertaking AP pelvis radiography using CALDOSE-X5 Monte Carlo software. The calculation of the ED was based on the measurements of X-ray tube output and the knowledge of exposure factors. The X- ray output was measured using Rad-Check ionization chamber for each X-ray tube. In total, seven X-ray tubes were enrolled to assess the patients' ED. Exposure factors includes tube potential (kVp), tube loading (mAs) and X-ray source to image detector distance-SID (cm)); these were recorded for each patient together with their demographic data (weight(kg) and height(m)). Five major hospitals were considered in this work (i.e. Al Sadder, Al Hakeem, Al Furat , Al Manzrah and Middel Euphrates cancer center).

Results: The average value of the estimated ED was ranged from 0.156 ± 0.041 mSv to 0.4068 ± 0.049 mSv across all hospitals. The value of max/min of the ED was ranged from 1.25 to 2.58 across different hospitals. The corresponding average values of the kVp used for this examination was ranged from 75 to 113.75 kVp; mAs: ranged from 11.7 to 42.1 mAs and for the SID the range was between 100 and 140.6 cm.

Conclusion:
The resulted data demonstrate there is a clear variability in patient dose and exposure factors set among the selected hospitals. The ED values were seen to be slightly lower than those reported by the UK (Survey-2010, 0.284 mSv) and were higher than those reported by certain countries (e.g. Canada, Ghana etc.). Overall, a periodic checking together with conducting a quality control testing is highly recommended.

Keywords: Effective dose, AP pelvis, Patient dosimetry, Radiation safety, Radiation protection

Nanocomposite Gold Nanoparticles and Hyaluronic acid synthesis using the atmospheric air jet plasma

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Abstract

The atmospheric cold plasma has been used in the synthesis of gold nanoparticles using different molar concentration from Aqueous gold tetrachloride salts $HAuCl_4.4H_2O$ mixed with Hyaluronic acid (HA) using a low-cost and simple method in order to create a cold plasma at exposure time of 6 min.The effect of mixing with different concentrations ratio of gold salts with 1mM of hyaluronic acid with ratio Gold salt:HA (10:1) were studied with the same exposure time which stated above to determine the best concentration for nanoparticles of gold. X-ray diffraction (XRD), UV-Visible spectra were used to characterize the nanoparticles. The synthesis of AuNPs indicated to surface Plasmon resonance (SPR) at 540, 544,and 550 nm for samples that prepared. The strong intense peaks that showed in the XRD patterns for all prepared samples is indicating to the face centered cubic structure and nature of crystalline of nanoparticles. The average size of crystallite were from 20 to 40 nm for the AuNPs, and the FESEM showed the AuNPs morphology. and the synthesize of AuNPs were showed by observations are have spherical shape and have diameters sizes from 16 to 38 nm. The outcome of the study revealed that the atmospheric air cold plasma is a promising technique to be used in production of the nanoparticle's materials for the medical application.

Key word: cold plasma, gold nanoparticles, plasma-liquid interactions.

Investigation effect of ZnO content on the structural and electrical properties of pulsed laser deposited (NiO) $_{1-x}$ (ZnO) $_x$ thin films

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Abstract

This research is devoted to the effect of investigation of the ZnO content on the structural and electrical properties of $(NiO)_{1-x}$ $(ZnO)_x$ films prepared by pulsed laser precipitation on the glass substrate at room temperature. Thin-film $(NiO)_{1-x}$ $(ZnO)_x$ sediments were deposited with different composition ratios where x = 0, 0.2, 0.4, 0.6 and 1.0 with a thickness of n150nm. The diffraction pattern for X-ray analysis reveals that the structure of the prepared thin films is identical with the cubic phase and hexadecimal stage of x = 0 and 0.1, respectively while the structure is mixed with the remaining x value from both stages. It involves studying the conductivity versus temperature to estimate conduction mechanisms and the Hall effect for determining type and carrier concentration as well as movement values. The results showed that there are two connection mechanisms and thus activation energies. Hall Effect showed that most of the prepared thin films were converted from type p to n of type x at = 0.2 and 1.0. Concentration of the carrier increases twice the volume while the mobility decreases by two degrees of volume by increasing the ZnO content from 0.0 to 1.0. The results were explained in terms of variation in the size of the crystals by increasing the ZnO content in the prepared thin films.

Keywords : NiO ,ZnO ,PLD, thin films (NiO)$_{1-x}$(ZnO)$_x$

Comparison between the gold nanoparticles prepared by chemically and laser ablation method

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Abstract

Noble metal gold nanoparticles were prepared by tow method. The first method gold nanoparticles (AuNPS) synthesised by the reduction of chloroauric acid (HAuCl4) with a solution for sodium borohydride. The second method the gold mineral plates were ablation by pulsed laser when it was immersed in filtered H_2O. The synthesized nanoparticles are characterized by using UV–Visible absorption spectroscopy, X-ray diffraction and transmission electron microscopy (TEM).

The Ultraviolet-Visible absorption spectra in the visible regions of the gold nanoparticles appear intense absorptions a result of surface plasmon resonance (spr) vibrations in noble mineral nanoparticles. From X-ray diffraction and TEM tests the particle size for the laser ablation method calculated was found to be lie between (15- 20 nm) and for chemical method approximately lie between (13-16 nm).

Keyword: Gold; Noble; Plasmon; Resonance;

FTIR analysis of PbSe thin films after irradiation of β-ray

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Abstract: PbSe semi conductors are considered to be suitable product for its phototransistor implementations for IR emission. The structural characteristics of PbSe nanostructures have been studied. Placing the produced thin films of PbSe on sufficiently washed quartz molecules by thermal evaporation technique. The structural characteristics of the FTIR recording device spectroscopy design Shimadzu have been employed to calculate the transmitted and absorbed wavelengths of PbSe thin layer placed in luminous spectrum (400–4000 nm) on quartz substrates pre and post β-ray radiation.

Keywords: **PbSe thin layers, FTIR, β-ray radiation.**

A study of Boron Concentration in samples which are taken from the waters of the Shatt al-Arab River in Basrah Governorates (Southern Iraq) by using ICP-OES Technique.

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Abstract

This research aims to know the boron concentration in samples taken from water which collected from the river of Shatt al-Arab .It passage through Faw and Abu Al-khaseeb district in Basrah governorate located in southern Iraq. The measurements were made by analyzing the samples were taken from 24 different sites by inductively coupled plasma mass spectrometry Technique. The concentration of Boron in the study was Between (0.30206) ppm in (Al-Doweb) and (1.1918) ppm in (near of Abadan refinery) within the Shatt al-Arab. The results of this research can be used to help implement the water quality standard by the competent departments in order to keep water sources free from pollution . The study showed that the boron concentration is most samples taken from the studied sites are not high, with the exception of some samples that may indicate the possibility of pollution in the future may pose a danger to humans and the environment.

Index Terms: Boron, Water samples, ICP-OES , Shatt al-Arab , Basrah Governorate

Nuclear Structure and Energy Levels of ^{158}Er, ^{160}Yb and ^{162}Hf Isotones

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 Abstract

The properties of even-even^{158}Er, ^{160}Yb and ^{162}Hf isotones are studied and its energy states calculated. To identify the properties of each isotone, the values of the first excited states $E2_1^+$ and the ratio of the second to the first excited states $R_{4/2} = E4_1^+/E2_1^+$ were adopted. The phenomenon of back-bending, the E-GOS curve and the odd-even staggering were studied. Examining the algebraic structure of the Bohr model (BM) clarified the relationship with the interacting vector boson model (IVBM) and the interacting boson model (IBM) which it has related solvable limits and corresponding dynamical symmetries. BM, IVBM and IBM were used to calculate the energy states for each isotone and compared with the experimental data. The results showed that the BM and IVBM are more comfort than the calculation of IBM-1. The contour plots of the potential energy surface (PES) to the IBM Hamiltonian for Er–Hf with N = 90 have been obtained using the intrinsic coherent state and evolve from deformed shapes to γ- unstable with decreasing the boson number.

Keywords: Back bending, BM, IBM, Ground band, IVBM, potential energy surface.

Ultrathin Perfect Metamaterial Absorber Based on Triquetra Shape

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Abstract. Electromagnetic Metamaterial perfect absorber EM-MMPA is representative an artificial electromagnetic material, which has many application prospects in huge fields like energy harvesting from electromagnetic wave. This work focused on the design and simulation ultrathin structure based on polarization unsensitive. However, based on the three-layer structure of copper reflector, dielectric layer and copper triquetra resonator. Through the results, it is found that, at 10.026 GHz with the fundamental mode of resonance can achieve a polarization unsensitive perfect absorption. Furthermore, all the materials involved in this work are easily available, and the size of the unit cell is also within the range of easy implementation, and it has a good prospect of many numbers of practical application.

DFT and TD-DFT Study of Favipiravir Tautomerism as RNA Polymerase Inhibitors : COVID-19

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Abstract: Favipiravir is an antiviral medication currently being trialled as a COVID-19 treatment. To help accelerate these efforts, we have performed a research for tautomers formations of favipiravir as possible RNA polymerase enzyme inhibitors and mitigating the virus ability. This study provides important electronic and optical properties of tautomers determined by density functional theory (DFT) and time-dependent density function theory (TD-DFT) calculations in gas phase and in water. A series of favipiravir derivatives was designed, and study the effect of the HOMO-LUMO energy gap on the efficacy of inhibitors. It has been determined that H-atom positions change and substituting fluorine (F) by hydroxyl (OH) group of tautomers affects the energy gap and dipole moment values. Among all compounds, the results have shown that Fb4 form with OH is most potent inhibitory activity in both gas phase and water. These investigations indicated that these tautomers could be potentially developed into drugs, but further investigations are still required to examine the cytotoxicity and consequent side reactions.

Keywords: COVID-19, Favipiravir, Tautomerism, Inhibition, TD-DFT

Construction of Nanobiomaterials using Chemical Method

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Abstract: ZnO "nanorods" perpendicularly aligned grown on (FTO) coated quartz substrates by using a hydrothermal method. Energy Dispersion X-Ray Spectrometry (EDXS) showed the elements of "Zn" and "O", moreover prove the high purity of ZnO nonmaterial. The element ratio of "Zn" and to "O" is quantitatively managed equal (89.4:10.6).

TiO_2 "nanotubes" grown on "Ti" foil by using hydrothermal and anodization method. The major components of the TiO_2 "nanotube" titanium and oxygen with compound percentage for the "Ti" and "O" are (65.1:34.9) respectively.

Keywords: ZnO, FESEM, XRD, TiO$_2$ nanotubes, Anodic oxidation.

Energy levels and electromagnetic transitions of some even-even and even-odd Barium Isotopes

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Abstract: Energy levels and B(E2) transitions for Barium isotopes with proton number Z=56 and neutron numbers (n) between 75 and 76 have been calculated through the interacting boson-fermion model. The set of parameters used in this calculation is the best approximation that has been carried out so far. Good agreement was found from comparison between the calculated energy levels and the transition probabilities B(E2) with those of experimental.

Keywords: Interacting Boson-Fermion Model, Ba isotopes, Energy levels, Positive parity, B(E2).

Fabrication and Characterization of polyaniline /CdSe Device for Applications in Nano Structured Solar Cells

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Abstract. Organic/inorganic heterojunction solar cells have been fabricated based on CdSe/PVA nanocomposite as an acceptor and PANI-DBSA/PS nanofibers as a donor material. CdSe/PVA nanocomposite PANI-DBSA/PS nanofiber materials have been prepared by chemical and electrospinning methods, respectively. X-ray diffraction, Atomic Force microscopy and scanning electron microscopy measurements technique reveals that the two nanomaterials have deferent morphology with the crystalline cubic structure of CdSe/PVA nanocomposite and amorphous phase of PANI-DBSA/PS nanofibers. The absorption spectra of PANI-DBSA/PS and CdSe/PVA nanocomposite thin films were analyzed in the wavelength range from 400 nm to 800 nm. the current-voltage density measurements of the solar cell which were performed in the dark and under illumination are reveal that the ideality factor of all the devices is more than one and the maximum power conversion efficiency is $0 \cdot 3\%$. The effects of temperature on the photovoltaic properties of solar cells have been investigated. The power conversion efficiency values increased with increasing temperature.

KEYWORDS: nanocomposite, electrospinning, polyaniline, CdSe, heterojunction solar cells.

External and Internal Hazard indices in fly ash samples from Al-Hartha thermal power station

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Abstract

In the presented study, internal and external hazard indices for fly ash's samples were measured from Al-Hartha thermal power station in the south part of Al-Basra province in Iraq. Eight samples were taken from different places inside the station. The samples were collected at year 2018 and compared with a previous study at 2014.

The range of total values (highest value and lowest value) related to the internal and external hazard indices was H_{in} =1.374 - 0.612 and H_{ex} =1.003- 0.529 , respectively.

Therefore, it is noted that some H_{in} and H_{ex} values are considered higher than the permissible limits set by international organizations, especially the S4 sample, taking into account that the values of radiation risk factors should be less than one (≤1) to be negligible. Therefore, the results of the measurements showed that the values of hazard indices related to some samples of fly ash that were taken from Al-Hartha thermal electric power station in Al- Basra are higher than the internationally permissible limits.

Keywords: hazard indices, fly ash, thermal power station.

Measurement of the thermo-optic coefficient and Ring surface profile of sulfadiazine azo dye by using milli watts cw laser beams

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Abstract

We report on the observation of thermal lens as well as multiple diffraction ring patterns due to the irradiation of the azo dye "1.8-Dihydroxy-naphthalin-3, 6 disulfonic acid [2-(4-Azo)]-N-(5-methyl-3-isoxazolyl)-benzene sulfonamide" at same time by three continuous wave, green (λ=532 nm), red (λ=635 nm) and blue (λ=473 nm), laser beams. This effect we observed at power input less than 10 mW for the pump 532 nm green laser and as low as 50 μW of beams from other two wavelengths. The number of rings for all three beams is totally controlled by the level of pump input power. The optical limiting of the azo dye solution using the 532 nm green laser beam is also demonstrated. The change in the material refractive index, $\triangle n$, the nonlinear refractive index , n_2, and the thermo-optical coefficient *dn/dT* are calculated based on thermal lens and diffraction ring techniques. The three quantities are found to be in the range of 10^{-4}, $10^{-7} cm^2 /W$ and $10^{-5} K^{-1}$ respectively by both techniques.

Keywords: Thermal effects, diffraction rings, nonlinear refractive index, diffraction ring.

Mathematical Model of the Electronic Coefficients for Different Concentrations of Argon and Mercury Mixture

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Abstract:

In this work, theoretical calculations and simulated data are presented that enable us to calculate the effect of Ar: Hg on the plasma electronic coefficients depending on the variance in the plasma field resistance, which presents in a varied electrical field and under thermodynamic equilibrium. The electric field was chosen in the limited range (1-1000) Td, and the concentrations in the limited range (0.01-0.09) mol. Results show a good agreement between the original data (using BOLSIG +) and that estimated data. There are a large number of applications, for example, material technology that uses flare discharge, thin-film deposition, invasive laser beams, and plasma screen TV. Other technological applications such as gas circuit breakers and L. of particle detectors have also been developed. The work includes calculating the effect of c variation on plasma electronic coefficients and different mercury concentrations of the argon and mercury mixture, and secondly, calculating the effect of the electric field (E / N) on electronic coefficients (mobility, the mean energy of electron, momentum frequency) by solving the Boltzmann equation using BOLSIG + where It was noticed that there is a clear effect of reducing the electric field (E / N) on the electronic transactions where the low electric field increases.

Key words: Plasma, Mean energy, Mobility, Momentum frequency, Electric field

NANOCRYSTALLINE SnO$_2$/TiO$_2$ FOR SOLAR CELLS APPLICATION

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Abstract

The developments in the field of solar cells need to create a new material to improve the electrical properties, which leads to an increase in conversion efficiency. So, in this paper, nanocrystalline Tin dioxide (SnO$_2$) as a thin film were synthesized and deposited on Titanium dioxide using chemical Spray pyrolysis thechniqe (CSPT). The mixed aqueous solution of Tin chloride (SnCl$_2$) was prepeared at room temperature using magnatic stirr and sprayted on glass slide at 300℃. Our results indicated that the prepared films are smooth, homogeneous and have good adhesion to the substrate. The results of structural properties revealed that the synthesis films are polycrystalline in nature with prefer orientations (110) and (101) for SnO$_2$ and TiO$_2$ respectively. The optical properties results using UV-Vis spectrophotometer analysis shows that high transmittance (grater than 70 %) and wide optical energy gap 3.97, 3.93 and 3.88 eV for TiO$_2$, SnO$_2$ and SnO$_2$/TiO$_2$ respectivly.

Keywords: Optical properties, pyrolysis technique, TiO$_2$ and SnO$_2$ thin films.

Spectral and structural properties of ferroelectric compounds Experimental Analyses

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Abstract

In this study two Ferroelectric compounds were prepared, The chemical formula of the two compounds were [BTO] and [BPTO], Both compounds were synthesized by ceramic method and calcined for 4 hours at 1000$\overset{\circ}{C}$. Then, the compounds were subjected to X-ray diffraction Analysis for the determination of their structural properties.From the results, the compounds were found to exhibit a tetragonal Perovskite with homogenous particle size in-between the samples; furthermore, there   was an observable increase in the Theoretical density. Similarly, Samples were subjected to atomic force Microscope (AFM) analysis for roughness, grain size, and root mean square.Upon Infrared analysis of the samples, the IR spectra showed an increase in the constant bond force (K) by a slight proportion of lead while the bond length (r) decreased by the same proportion.

Keywords: Ceramic method; X-ray Diffraction;Ferroelectric; Infrared Spectroscopy; Atomic force microscope.

Silver and Cadmium Mattel segment Doping by DC Sputtering

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Abstract:

This research deals with the process of deforming cadmium metal with silver metal directly by planting pieces of silver cylindrical shape on the surface of the target material of cadmium and by using the DC reactive magnetron sputtering technique deposit on a glass substrate. The flow rate of argon and oxygen gases fixed to (90 and 10) sccm and sputter time was 120 min per model (0, 1, 2 and 3) Ag chips, the current of sputtering and the voltage of sputtering were kept within the process of deposition at 18 mA and 1300 V, The temperature of substrate had been set at 150°C. The structural properties showed that all films prepared have a polycrystalline diffraction pattern with a predominant orientation of the plane (111) and an increase in the size of the crystal from 17.17 nm to 19.30 nm with the number increases of chips above the surface of target material, and the growing of spherical nanoparticles with a diameter ranges from (25- 40) nm

Keywords: Cadmium Oxide, Sliver, Chips technique, Transition Electron Microscope, DC reactive magnetron sputtering.

Calculation of radioactivity levels for various soil samples of Karbala - Najaf road (Ya- Hussein) / Iraq

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Abstract

Ya- Hussein an outer road that links the governorates of Najaf and Karbala / Iraq , the soil on this road is a sandy desert . The study was conducted to calculate the radioactivity and the risk indicators for this soil, because this study is of great importance due to the contribution of many factors to increasing the concentrations of radionuclides as they are transported through the soil then to humans and endanger their lives. We have estimated ^{226}Ra, ^{232} Th and ^{40} K concentrations in the paper, with their radiological risks in 15 soil sample types gathered from road Ya - Hussein / Iraq, investigated by using gamma ray spectrometry detector NaI (Tl). The result showed the soil sampling concentrations of ^{226}Ra, ^{232}Th, and ^{40} K were there an average among 17.386±1.327   , 15.889±0.556 and 553.269±4.997 with unit (Bq.kg^{-1}) respectively . Likewise ($\mathcal{H}_{in}$; $\mathcal{H}_{ex}$) hazard indices , total annual effective dose which was below the internationally recommended limits and excess life-time cancer risk (ELCR) were calculated (0. 793*10^{-3}) was lower than the worldwide value. All parameters were statistically studied, and the correlation between the parameters studied was calculated, Pearson's correlation and (P value) among the variables .The correlation between gamma index (Iγ) and Alpha index (I$_\alpha$) was strong, positive and direct ,where it was statistically significant (p-value < 0.05) . The studied area is considered safe and the samples are free from radiation safety threats then the soil does not pose a health risk in this road .Thus this study can be considered as a baseline for future studied on the studied area.
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Key Words :soil, radionuclide, hazard index ,annual effective dose, Iraq.

Improving the attenuation Ability of gamma rays for silicate glass system composites (GS-PbO): a comparative theoretical study

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Abstract

Mass attenuation coefficients (μ/ρ) were calculated for seven models distributed between the ordinary concrete (Conc.), The silicate glass system (GS), and the composite of (1-x)GS-(x)PbO, where x = 0.15, 0.3, 0.45, 0.6, and 0.75 fractions by weight (wt), using the XCOM and XMuDat programs for the range of gamma photon energies from 0.1-50MeV. The results of the calculations of the linear attenuation coefficient (μ), the half value layer (HVL), the relaxation distance length (λ), and the transmission factor (T) showed a marked improvement in the ability of radiation attenuation when increasing the concentration of the reinforcement material in the composites. In general, the values of μ were inversely proportional and the values of HVL, λ, and T were exponentially proportional with increasing gamma photon energy values up to 10MeV, after which their behavior was gradually slightly reversed for all samples of the composites. Finally, the results showed that μ increased exponentially, at 0.662, 1.173, and 1.333MeV energies, with the increase in the reinforcement material which achieved the highest values at the energy of 0.662MeV. Also, the values of HVL, λ, and T of different thickness values of shield material decrease linearly with increasing reinforcement material, and T values increase significantly with increased sample thickness for all types of shields.

Keywords: Gamma ray, Attenuation coefficient, Half value layer, relaxation distance, Transmission factor.

SILVER NANOPARTICLES SYNTHISIS BY GREEN METHOD AND LOADING OF THE ENTEROSEIN TO STUDY ITS ANTIMICROBIAL INHIBITION

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ABSTRACT

   This study aims to loaded the Enterocin produced from *Enterococcus faecalis* bacteria on silver nanoparticles(SNP+En) by using green synthesis ,to increase the effectiveness of Enterocin against some Gram-positive and negative bacteria *Escherichia coli*, *Pseudomonas aeruginos, Salmonella typhimurium* , *Staphylococcus aureus, Bacillus subtilis* and *Candida albicans* yeast. SNP was synthesized by using *Alettaria cardamomum* alcohol extract as a reducing agent, then it was loaded with Enterocin . The color change of the extract was preliminary evidence of the reduction process. The UV–Visible spectral analysis confirmed the synthesis of SNP and SNP+En showing a characteristic peak around 452-419 nm due to the absorption of the surface of the plasmon and SEM from 18-88 nm, analysis to the X-ray data indicated that SNP and SNP+En have four clear peaks were shown at the angle of Ө 38 °, 44 °, 64 ° and 77.5 °, and this is due to symmetry levels (111) and (200) (220) and (310) preferentially at the level (111) and zeta potential for SNP it reached 22.55 mV and it became 31.25 mV for SNP + En . demonstrated Inhibitory effect against Gram-positive and negative bacteria for SNP + En was more than SNP at the same ratio(0.1%).

keywords: UV , antibacterial activity,   SEM , nanoparticles, Characterization

Natural Radioactivity in Underground Waters In Tallafar Distract In Iraq

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Abstract

The purpose of the present study is to measure the level of the natural radioactivity of (underground waters samples) in Tallafar district center, from the Alayadiyah side, and from the Al-Adaya village, determination of specific activities of $(^{228}$Ac,^{226}Ra,^{214}Pb, ^{137}Cs, ^{40}K), (0.40716), (0. 2321), (0. 281), (0.76751), (4.9806) Bq/L respectively using gamma ray spectroscopy technique with NaI(Tl) scintillation detector in 15 samples, also evaluation of radiological hazard indices(radium equivalent Reaq, absorbed dose rate(Dγ), annual effective dose (AEDE indoor) , AEDE(outdoor), hazard induces (Hex and Hin) and gamma index (Iγ)) . The results showed that the average value of the specific activity are agreement with IAEA publications.

Chemical Toxicity Risk Assessment of Uranium in the Fly Ash from Thermal Power Plant (GNDTPP) of Bathinda City, India

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Abstract
Uranium can be released into the environment from various activities such as the use of phosphate fertilizers, combustion of coal in thermal power plants, mining, and depleted uranium used in the wars. One of the talked about sources for such water contamination in Bathinda city is the fly ash from the coal-fired thermal power plants. To assess the role of fly ash and Chemical toxicity risk associated with uranium from the fly ash to the water, the coal, dry fly ash, ash slurry and water samples collected from the surrounding of Guru Nanak Dev Thermal Power Plant (GNDTPP) in the Bathinda city of Punjab state, India. The samples were analyzed using the X-ray fluorescence set up. In the present work, we found that uranium concentrations in the dry fly ash and coal samples were higher than permissible limit i.e. $<$ 2 ppm but the concentrations in the ash slurry and water samples was below the safe limit of 30 μg l^{-1} as recommended by World Health Organization (WHO, 2011) .The $_{38}$Sr concentrations are also found to be 0.103-1.210 ppm and with average value 0.576 ppm in the various types of water in surrounding of the thermal power plant. The concentrations of $_{42}$Mo are found to be 0.002-0.050 ppm and the average value 0.022 ppm below the safe limit of 0.07 mg/l as recommended by World Health Organization (WHO, 2011) and Bureau of Indian Standards (BIS, 2012). Chemical toxicity risk calculated in the form of lifetime average daily dose (LAAD) and hazard quotient. The lifetime average daily dose (LAAD) values of ash slurry and water samples were found to be lower than WHO (2011) recommended level of 1 μg kg^{-1} d^{-1}, and the values of hazard quotient of the study samples were found to be lower than unity expect dry fly ash and coal samples were higher than permissible limit. The present study is concluded that uranium contamination in water of Bathinda city is not due to the Thermal Power Plant, and there is indicating no chemical toxicity risk due to uranium from the fly ash to the water.
Keywords: Uranium, Thermal power plant, fly ash, Chemical toxicity risk

WBCs detection depending based on a binary conversion of the color component in a Ycbcr color space

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Abstract

   Detection of white blood cells (WBCs) automatically is an important issue that has many applications in the field of medical imaging, in this research, we tend to detect white blood cells depending on the $Ycbcr$ color space. The proposed method has been used for the binary conversion of color compounds $cbcr$ depending on the certain threshold limits. In the experimental results from microscopy images of blood samples, the proposed algorithm was compared with several other algorithms for detection by using a quality scale that compares manual cell count with automatic detection of algorithms where the proposed algorithm obtained a high distinction accuracy reached to 100% compared to other methods.

Keywords: binary image, color space, image processing, Ycbcr transform, WBCs detection.

Density functional theory study on the adsorption of AsH3 gas molecule with monolayer (AlN)21 (including pristine, C , B doped and defective aluminium nitride sheet)

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Abstract

The interactions between on graghen -like aluminium nitride $P(AlN)_{21}$ nan ribbons doped and defect $(AlN)_{21}$Sheet, $P(AlN)_{21}$, $(AlN)_{20}$-C,$(AlN)_{19}$–C_2 , $(AlN)_{20}$ –B,$(AlN)_{19}$ –B_2, D-$P(AlN)_{20,}$ D-$(AlN)_{19}$ –C, D-$(AlN)_{18}$ –C_2, D- $(AlN)_{19}$ –B, D- $(AlN)_{18}$ –B_2), molecules and small toxic gas molecules (AsH_3), were built for two different adsorption sites on graphene like aluminium nitride $P(AlN)_{21}$, have been done by employing B_3LYP density functional theory (DFT) with 6-31G(d,p) using Gaussian viw5.08 package of programs and Nanotube Modeller program(2018), The most stable adsorption configurations, adsorption energies, charge transfers (total Mulliken charge), electronic and band structures are calculated to deeply understand to find the sensitivity of all studied sheets for toxic gas AsH_3 .

 In this research we got the adsorptions of AsH_3 on $P(AlN)_{21}$, $(AlN)_{20}$-C,$(AlN)_{20}$–C , D-$P(AlN)_{20,}$ D-$(AlN)_{19}$ –C)are weak physisorption with an adsorption energy (E_{ad}) **(-0.427197**eV),(**-0.43536** eV, **(-0.405364** eV), **(-0.456738** eV) and **(-0.495222** eV) , respectively (on atom) While (E_{ad}) of AsH_3 on the center ring of the $P(AL-N)_{21}$, (C) atoms-doped $P(AL-N)_{20}$ sheet , D-$P(AL-N)_{20}$ and D-(C, B)atoms-doped $P(AL-N)_{19}$ sheet are **(-0.484338** eV),(**-0.476175** eV), **(-0.454407**eV), **(-0.495222** eV) and **-0.481617**eV) respectively, otherwise doped aluminium nitride for this atom could be a good sensor for this gas AsH_3, except the adsorption of AsH_3 on B atoms-doped $P(AlN)_{20}$ sheet are a strong chemisorption, in this case, the B atoms-doped $P(AL-N)_{20}$ sheet could catalysis or activate, suggesting the possibility of $P(AL-N)_{20}$ as a metal-free catalyst , the total Mulliken charge on the molecules, and positive number means charge transfer from gas to $P(AlN)_{21}$.

Swarm of Electron Simulation in Carbon Dioxide Parameters for Intermediate E/N Values

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Abstract

The rotational excitation and transfer of low-energy electrons cross-sections in carbon dioxide have been obtained to compare in the theoretical & experimental values of the kinetic and diffusion coefficient. the transport coefficients theoretical values of were gained by calculating the delicate electron energy distribution functions using a putative elastic and inelastic cross-sections combination. The values for movement, drift speed, average electron energy, and power noticeable with experimental data were compared. Alteration were made to the default cross sections until obtaining good agreement . Transport coefficients were calculated for values between (6×10^{-17} - 6×10^{-15})V cm^2 with energy zoning 0.035 eV at 300k^o temperature.

Keywords: Basic swarm data, diffusion, electron swarm coefficients, electron transport, non-thermal plasmas applications, and swarm parameters.

Synthesis and analysis of gold nanoparticles produced by laser

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Abstract

Gold nanoparticles are produced by employed nanosecond pulses of Nd:YAG laser using laser ablation process in liquid. The two systems used are Nd:YAG of 6 and 10 nanoseconds pulse duration with variable energy in the range (700-760 mJ). The formation of gold nanoparticles has been rerealed using TEM with uniform size distribution. Also , it has been discovered that the mean nanoparticles sizes of 70 and 100 nm for gold respectively when similar laser parameters are used. In addition , theoretical Mie-Gans model was used to estimate the temperature distributions for both gold nanoparticles. Another aspect that has been discovered is that the maximum temperature of about (40 k K^{o}) and (60 k K^{o}) for gold nanoparticles, especially to prepare nanoparticles in the presence of Nd:YAG of 10 ns.

Porous Scaffold Implantation for Bone Fractures Healing

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Abstract

The objective of this research was to evaluate the efficacy of **Low Level Therapy of Continuous Diode Laser** on porous **Hydroxyapatite-Chitosan–Collagen** scaffold implantation by daily clinical observation, weekly radiographic findings and histopathological examination at the end of 3rd, 6th , 9th and 12th weeks after surgery. Fifty Healthy adult rabbits of both sexes were used to induced diaphyseal Femur and to remove about (1±0.05 cm) of bone, as empty space filler.

Keywords: Hydroxyapatite-Chitosan–Collagen, histopathological examination, Scaffold, Radiographic findings**.**

Calculating the Nanometer Diameters of The Grains Zno: SnO$_2$ Composite Depending On The SEM Image Analysis

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ABSTRACT:
In our research, were prepared ZnO: SnO$_2$ composite thin films from compounds mixed according to proportions volumetric (20, 40 ,60 and 80) % specific proportions, and then we obtained microscopic images of them using the scanning electronic microscope(SEM), scanning with Nano and micro diameter .The images and scaled and their measurements worked filter from impurities and obstacles to obtain the largest possible information about the surface of the thin film and distribution the numbers and areas of the thin film grains according to the most accurate measurements, then used thresholding for images to isolate the original compounds of the composite thin film and know their numbers, areas, sizes and all information related to the compounds that make up the film. From the data and all the information we concluded that the number of grains in the Nano diameter is greater than the micro diameter but the areas and sizes in micro measurement is greater than Nano measurements, as well as the distribution of the nano range diameter greater than the distribution of the micro range diameter.

KEYWORDS : *Image Filtering, Distribution; Grains, diameter Range*, *Particle Isolating.*

Study the effect of changing aperture size on linear and nonlinear properties of wheat germ oil

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Abstract

Thespectroscopic and nonlinearproperties of wheat germ oil have been investigated .Two different sources of oil (weight 3.33gm),locally (Emad) and global (Hemani) were used in this work. Theabsorption and fluorescence spectra of the two types of oil were carried out to calculate thequantum efficiencyof them. Nonlinear characteristics were measured by z-scan.The results showed that high quantum efficiency (91.5 for the local oil and 76.6 for the other) As for the non-linear properties, it was measured for wheat germ oil (Emad) by scanning technology (by changing the value of the closed hole (pin hole), the value of (n_2) the non-linear refractive index changes with the size of the aperture (1, 1.5, 2, 2.5) mm..
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Key words: wheat germ oil, nonlinear properties, z-scan,nonlinear refraction (NLR), nonlinear absorption coefficient (NLA).

Some Electromagnetic Transition Properties of Odd-A Palladium Isotopes

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Abstract: Energy levels and B(E2) transitions for palladium isotopes with proton number Z=46 and neutron numbers (n) between 57 and 67 have been calculated through the interacting boson-fermion model. The set of parameters used in this calculation is the best approximation that has been carried out so far. Good agreement was found from comparison between the calculated energy levels and the transition probabilities B(E2) with those of experimental.

Keywords: Interacting Boson-Fermion Model, Pd isotopes, Energy levels, Positive parity, B(E2).

The Influence of Solar Radiation on Ozone Column Weight over Baghdad City

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Abstract. The ozone layer is part of the atmosphere surrounding Earth. This layer, like anything natural, depends on the balance in its quantitative components, but in front of human aspirations that reach the level of destruction. Make these chemicals a factor in destroying and destroying the ozone layer. Ozone is found naturally in the stratosphere due to a series of interactions between partial oxygenation and atoms. The methods used in the study depend on the monthly and yearly average Ozone (O3), Incident Solar Radiation (ISR) and Temperature (T) taken from the European Mediterranean Weather Forecast (ECMWF) during the period (2014-2018) for the Baghdad region. The largest ozone value was recorded in March and April, and the lowest in September and October. The highest value of Incident Solar Radiation was recorded during June and July and the lowest value in January and December, while the highest value of temperature was during July and August, and the lowest value in January and December. As for seasonal analysis, it was observed that ozone was high during spring and low during summer and Incident Solar Radiation (ISR) and T were observed high in summer and less in winter. In addition, the binding strength of ozone (O3) with ISR was positive and O3 with T inverse.
Keywords. Ozone, Incident Solar Radiation, Temperatures, ECMWF, Baghdad.

Estimation of Uranium Concentration in sediment Samples of the Part of the Shatt al-Arab passing in central and southern Basrah Governorate using   ICP-MS Technique

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Abstract

   This work included measuring the concentrations of uranium element in 32 locations of sediments samples were collected from the bottom of the central and southern of shatt al-Arab in Basrah Governorate by using ICP-MS technology, which are found that the uranium concentrations ranged between 1ppm In front of Salhia River and 2ppm in   Abu Flous Port located on the shores of Shatt Al-Arab. Measured samples of sediments taken from several locations in central and southern Shatt al-Arab indicate that the uranium concentration is less than 100 ppm, a concentration that characterizes the quality of waste and burdens, rather than mining reserves. This study reveals 32 samples containing uranium concentration within internationally permitted limits. The present results have shown that the uranium concentrations in the studied sediments samples are less than the allowed value (11.7 ppm) recommended by UNSCEAR, 1993.

Keywords: Uranium, sediment samples, ICP-MS, Basrah Governorates

High Efficiency (41.85) of Br Perovskites base solar cells with ZnO and TiO2 comparable study as ETM

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Abstract: Due to its ease of processing, low production costs, superb light-harvesting characteristics, and high efficiency, organic-inorganic perovskite solar cells have attracted great attention in the photovoltaic research community in recent years, making it more preferable than other existing solar cell materials. Lead-based perovskites (CH3NH3PbX3, X= Cl, I, Br) solar cells have recently achieved high efficiency of ~19.3 percent, well exceeding most thin-film and organic solar cells' efficiencies despite its potential for photovoltaic applications, organometal halide perovskites have attracted considerable attention recently and are also considered as promising materials in light-emitting devices. In particular, photovoltaic devices with efficiencies above 20 percent have been prepared using organometal halide perovskites as absorbent materials in the last few years A planar. The standard design for a planar hetero-junction perovskite-based solar cell is: Back electrode/ Hole Transport Material (HTM)/ Perovskite absorber / Electron Transport Material (ETM) / Transparent electrode. The hole mobility and acceptor concentration of the HTM, interface trap density, and work-function of back contact metal have shown a significant influence on the device performance. Also with these good merits.In this research, two types of ETM (TiO$_2$and ZnO) were used with the Perovskite CH3NH3PbBr3and was found that the use of TiO2 with perovskite achieved high efficiency of 41.85% while the use of ZnO with perovskites we obtained an efficiency 17.67%.

Method/Analysis: Solar cell architecture assessment is conducted using Solar Cell Power Simulator(SCAPS). This is a computer-based software tool and is well equipped to research photovoltaic structures with barriers to homo and heterojunctions, multi-junctions, and Schottky. This model optimizes various parameters such as thickness, absorber layer density, Electron Transport Material (ETM),Density of accepter and donor (ND and NA), and Hole Transport Material (HTM) doping concentrations. Achievement and simulates electrons and holes based on the Poisson's and continuity equation The effected thickness of CH3 NH3 PbBr3 different from 0.05μm to 1.2μm and the finest results are observed at 0.05μm.

Effect of Cerium Oxide (CeO$_2$) nanoparticales on electro – optic responses of acrylate liquid crystal polymer

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Abstract:

This study focused on the electro-optical properties of a liquid crystal which contains a back bone of acrylate.

A fixed molecular weight of liquid crystal acrylate was applied to five separate amounts of nanoparticles (CeO$_2$), impacting the electro-optical properties of the liquid crystal. The added nanoparticles can lower the glass transfer temperature, resulting in a decrease in the processing period leading to an improvement in the polymer 's viscosity which has significantly influenced the liquid crystal polymer's optic properties. In this work we notice that the light strength of the lasers will decrease by growing the added nanoparticles, and thus the opening period will be decreased.

Key words: CeO$_2$ nanoparticles, polymer polysiloxane , electro – optic response

Study the effect of colors on the optical properties of imported glass

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Abstract

Several models were chosen from imported glass in different colors (transparent, blue, bronze, green), and with different thicknesses (4-6-10mm) available in the Iraqi market. The intensity of the beam, the light transmitted with the thickness change, was measured to determine the permeability characteristics. Calculating the energy gap for direct and indirect transference allowed. It has been shown that the permeability change with the change in color and thickness of the sample. In addition, transparent glass has High permeability comparison with other types, and that the visual characteristics depend on the thickness of the sample.

Kay word: imported glass, different colors, permeability characteristics.

Ions energy loss measurements in low and high temperature plasma

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Abstract
Stopping power due to collisions ions with free and bound electrons in a plasma targets, is analyzed dependent on the classical-Bohr and quantized-Bloch for different temperatures. The energy loss and stopping power of ions calculated by using dielectric formalism $\in^{-1} (q, \vec{q}.\vec{v})$ and study different affects plasma parameters on the movement ions channeling in plasma target, at low (1, 1.5) eV and high (103) eV temperatures, density (ne= 1020) cm−3 and Debye length (λ_D=0.2) a.u. The results are obtained for dielectric function equation. Showed the sopping power and energy loss dependent on the plasma parameters and movement ions increases about 30%.

Keywords: Stopping power, energy loss ions, Temperatures plasma, Plasma parameters.

Study the effect of thickness change on optical properties of Rhodamine B

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Abstract:

The optical properties of an organic laser dye, Rhodamine B in water is an important for modern applications, the linear optical properties of the absorption and fluorescence spectrum of the liquid dye were discussed, and the highest value of quantum yield was reached at 96% at a concentration of (10^{-7}) Ml a high quantum yield allow numerous applications of used doped host in optoelectronics applications and after knowing the most appropriate concentrations, a thin film of polyvinyl alcohol was dye, Study of the effect of film thickness on optical properties, the film has optical properties, reflexivity, refractive index, extinction coefficient, real and imaginary isolation constant, and the best thickness was at (4) µm. The energy gap was calculated and was inversely proportional to the thickness.

Key word: Rhodamine B, PVA, Quantum yield, Optical properties.

Plasma Parameters Generated from Iron Spectral Lines By Using LIBS Technique

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Abstract.

An interesting LIBS technique was used to investigate the optical emission spectral plasma of iron metal properties. To generate plasma from the surface Fe, Q-switched Nd-YAG laser with wavelength 532 nm and a focal length 10 cm was used with different energies (500-800) mJ. Then plasma parameters were calculated; electron density ne ranged between (0.92-1.4) $\times 10^{18}$ cm^{-3}, the electron temperature Te was in the range of (2.19-2.59) eV. These calculations were done using Boltzmann's plot and the Stark broadening respectively depending on the experimental spectrum, and followed up to estimate the others plasma parameters, Debye length (λ_D), frequency (f_p) and the Debye sphere (N_D). Results indicate that plasma parameters are proportional to the energy of laser due to the increase in the intensity of spectral lines energy, and that plasma shielding of iron increases with laser energy in the range of (3.2-4.3).

Keywords: Laser-induced plasma (LIP), Iron Plasma parameters, Optical emission spectroscopy (OES).

Measuring the level of Radioactive contamination of selected samples of Sugar and Salt available in the local markets in Najaf governorate / Iraq

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Abstract. Natural radioactivity has attracted a lot of attention in the world due to its crucial role in human safety. Sugar is compound, which is the generic name for sweet, soluble carbohydrates, many of which are used in food while salt is commonly used as a condiment and food preservative. Sugar and salt are very important for human beings, as well as their proven benefits to the general health of human beings. Therefore, the measurement of natural radioactivity is a critical because of its direct impact on human safety. In this research, quantification has been made of natural radionuclide concentrations using NaI(Tl) gamma-ray spectrometry. The analyses of samples reveal the mean activity concentrations of ^{226}Ra, ^{232}Th, ^{40}K and $\mathcal{R}a_{eq}$ are found to 5.833±1.008, 5.922±0.721 ,138.656±0.826, and 24.980(Bq.Kg^{-1}), respectively .also, calculated I_α, I_γ and H_{in} the values were less than one, it was clear that the ratio of three nuclides concentrations were higher than internationally allowed limits. the estimated annual gonadal equivalent dose (AGED) resulting with an average 86.321*10^{-3}(mSv.y^{-1}) where lower than globally limits. The data were statistically processed and Pearson's factor with p–value were calculated for concentrations of ^{226}Ra, ^{232}Th and ^{40}K with annual ingestion dose for these nuclides where correlations of ^{226}Ra were more a high increase statistical significance, direct, and positive with other parameters .The consumption of sugar and salt for adult, children and infant , where found the maximum value of cancer risk (ELCR) 0.2421*10^{-3} in adult for consumption of sugar while the minimum value 0.0005*10^{-3}in infant from consumption of salt ,which is less than the global value 2.5*10^{-3} that assessed by the united nations scientific committee on the effects of atomic radiation to be due to food and water intake.

keywords: Hazard indices , AGED , ELCR , sugar ,salt.

Texture Analysis of Breast Cancer via LBP, HOG, and GLCM techniques

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Abstract. Breast cancer is a prevailing reason for death, and it is a particular kind of tumor that is popular among ladies across the world. Till presently, there is no efficient method to stop the appearance of the breast tumor. Accordingly, early detection is the first stage in the diagnosis of breast tumors and reduces mortality. Screening Mammography is the most effective technique for early detection of breast tumors. Great experience and large practices of specialists are wanted when examining breast tissue in a mammogram. In this work, feature extraction techniques are offered as methods to decrease false-positive that occur in breast diagnosis. Mini-MIAS database used to evaluate these approaches. LBP, HOG, and GLCM are feature extraction techniques used for analyzing mass tissue and extract features from the ROI. Contrast, energy, correlation, and homogeneity are used as features properties. These features utilized as the input to the different classifiers which achieved the best results. To improve the diagnosis ability, "contrast limited adaptive histogram equalization" utilized as a pre-processing system. The best results gained in this work by LBP method and logistic regression classifier at ROI (30×30) where the accuracy 92.5%. The HOG method achieved the best results with the SVM classifier where accuracy 90% at ROI (30×30). GLCM provides the best results with the KNN classifier where the accuracy 89.3% at ROI (30×30). The greatest accuracy reached in the case of ROI (30×30) in all feature extraction methods that used in this work.

Study the Magnetization of Water using Digital Camera and Laser beam

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Abstract

In this research, the magnetization of the water was investigated through the digital image processing technique of the laser spot after passing through magnetic water. This was done by using different magnetic fields and at different times. It was found that changes in the image of the laser spot are changes in the intensity of the pixel value of the spot image, i.e. the amount of attenuation in the amount of light illumination. The increased exposure time and field strength accelerated the intensity of pixel illumination, due to the rapid deposition of suspended substances in the water by shedding the magnetic field. This study found a new method for measuring the purity of water remotely using remote sensing technology and digital image processing. The laser spot image was studied and analyzed using different methods and software such as MATLAB, Image J, Curve Expert Professional and Origin lab 9.0, also The refractive index of normal water and magnetized water was measured using this technique .

PH and the concentration of salts dissolved in water before and after magnetization were measured and compared between them using devices.

Keywords: Laser Physics, Image Processing, Magnetized Water.

Assessment excess lifetime cancer risk of soils samples in Maysan neighborhood adjacent to the middle Euphrates cancer center in Najaf / Iraq

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Abstract:
In this study, 30 samples of soils were taken from in Maysan neighborhood adjacent to the middle Euphrates cancer center in Najaf / Iraq, gamma-ray spectrometer system connected with the NaI detector was used to measure the specific activity of the (^{238}U, ^{232}Th, ^{40}K) nuclei, the specific activity values were varied from(1.41±0.71Bq/kg) to (30.95±0.74 Bq/kg) with an average value(10.03± 1.04) for ^{226}Ra, for ^{232}Th from (0.71±0.27) to (15.44±0.30 Bq/kg) with an average value (4.96±0.37), The measurements of the specific activity of the ^{40}K varied from 92.77±1.95 to 589.77±3.18 Bq/kg with an average value (198.43±3.13).

Radium equivalent activity, outdoor and indoor absorbed doses, the Outdoor, Indoor and total annual effective dose equivalent (AEDE), external and internal hazard index (H_{ex}, H_{in}) in the range of 32.415±1.817(Bq/kg) ,16.104±0.827(nGy/h) ,20.936±1.075(nGy/h) ,0.019±0.001014(mSv/year),0.102±0.0052(mSv/year) ,0.121±0.0061(mSv/year), 0.087±0.004 , 0.114±0.007 respectively , Representative level index Iγr and excess lifetime cancer risk (ELCR), Representative Alpha index (Iα) and annual gonadal dose rate (AGDE) were calculated with range, 0.248±0.012(Bq kg-1), 0.423*10^{-3} , 0.052(Bq/Kg) , 119.404(mSv/y) respectively. These results were compared with recommended values (370 Bq/kg) for Ra$_{eq}$, 59 nGy/h for D$_{out}$, 84 nGy/h for D$_{in}$,0.07 mSv/year for Deff$_{out}$, 0.41 mSv/year for Deff$_{in}$,0.48 mSv/year for Deff$_{tot}$, ≤1 for H$_{ex}$ and H$_{in}$, <1 for Iγr, <1 for Iα , 300 µSv/y for AGDE by UNSCEAR International Commission on Radiological Protection (ICRP) and European Commission (EC), and Their values were less than the permissible limits except for one sample out of 30 samples have specific activity values of ^{40}K, Annual Gonadal Equivalent Dose (AGED) in sample (S6)higher than the worldwide average value (412 Bq/kg)and(300 µSv/y) recommended by the UNSCAER, besides, the value of ELCR was lower than the world permissible value of 1.45×10^{-3} (UNSCEAR,2000). As a result, health hazards originated by natural radiation from soil samples in this region is low and insignificant.

Keywords: soil, radiological hazards, Gamma spectroscopy, radioactivity, Najaf Governorate.

Effect of polysiloxane Liquid Crystal Polymer on tin Oxide(SnO$_2$) Nanoparticles Properties for Humidity and Climate Components Sensors

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Abstract:
In the conjugation between atmosphere, land and hydrometeorology, one of the primary concerns is how the environment and climate depend on the interaction between precipitation, soil and plant moisture, clouds and irradiation (Rn). Throughout the hot season, the Earth's surface temperature is determined by large-scale synoptic processes, the atmosphere boundary layer (BL), storms, and precipitation. To study all climate and humidity properties, various devices in which liquid crystals are used . In this study, the properties of liquid crystals are studied and improved. and using nanomaterials for better, faster and accurate results.

The effect of sno$_2$ nanoparticles on the properties of electro-optical polysiloxane crystals used in humidity and climate measuring devices has been studied. Five different ratios of nanoparticles were added to the liquid molecular weight of liquid crystal siloxin. We note that the viscosity of the polymer will affect the properties of the liquid crystal, and the glass transfer temperature will decrease due to the added nanoparticles. As a result of the theoretical threshold voltage effort, the effect of sno$_2$ nanoparticles on voltage and response times has been studied.

Key words: sno$_2$ nanoparticles, polymer polysiloxane , electro – optic response

Study Effect change amount addition of Sn2P2S6 nanoparticles on Thermal , Mechanical and Optical Properties of Polysiloxane Polymer

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Abstract

The paper included the influence of addition of $Sn_2P_2S_6$ nanoparticles on the Mechanical, Thermal, and Optical characteristics of liquid crystalline polymers with side chain. A constant Molecular weight was used (1.7×10^6). The additive ratios were five different ratios of the added $Sn_2P_2S_6$ nanoparticles. It was noted that the voltage operation decreased with the increase of the ratio of the additive. The optical response (τ_{on}) was measured in opening case (when the electric field was applied) and closing time (τ_{0ff}) (when removing the electric field) by calculating the time interval between the primary and the new classification for liquid crystal polymer molecules caused by the electric field, Laser light while passing through the electrophoresis cell. The different addition ratio of **$Sn_2P_2S_6$** particles, which had a fixed molecular weight from polymer , increased the density of the mesogenetic group associated with the polymer chain. This increased the effect of dipole torque in the $C \equiv N$ group parallel to longitudinal axis of mesogenous unit, The dielectric anisotropy $\Delta\varepsilon$ has a lower optical response time (τ_{on}), (τ_{off}), thus improving the electro-optical properties of the system.The change in threshold voltage was measured at constant steps and under T_{NI} for a series of different additives' and found that the high additive additives had a small threshold voltage and this had to do with the polymer elasticity constant . Infrared spectrometer measurements were used to determine the coefficient of the directional arrangement of liquid crystals with a side chain. By determining the vibration of a specific package ($C \equiv N$) for absorption, it was found that the coefficient of the guideline is based on the temperature.

Keywords : Sn2P2S6 nanoparticle , polysiloxane , Thermal, Mechanical and Optical Properties

The Effect of Plasma Treatment on the Speed of Healing of Wounds Similar to battle wounds

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Abstract

Cold plasma has been successfully applied in several fields of medicine. Previous studies have provided evidence that plasma supports the healing of wounds. This work was done to study the effect of cold plasma on the speed of wounds recovery for wounds Similar to battle wounds implemented on rats. The rats were divided into four groups; the control group was injured and left untreated, in order to compare it with the groups that were treated. And the second group was treated with penicillin only Six hours after applying the wound. And the third group was treated with an argon plasma jet immediately after the wound is applied and polluted with dust. The fourth group was treated with penicillin and plasma, the plasma was used immediately, but the penicillin was used after six hours. The wound was 1 cm long and 0.5 mm deep. The rats were treated by plasm jet for three days 15 minutes per day, and the penicillin was used daily once according to the protocol. The wounds were photographed as soon as they were performed; it was visually monitored, and documented with photos after three days, seven days, and fourteen days later. It was found that wounds treated with plasma and penicillin are the best case of treatment with penicillin alone or with plasma alone, and treatment with plasma alone is better than treatment with penicillin alone. Where the wound size was became smaller and fully healed. That was by comparison with the control group that was left untreated. From this we can conclude that plasma is a possible way to speed of healing of wounds similar to battle wounds.

Keywords: Nonthermal plasma, healing wounds, Aragon plasma jet, battle wounds.

Antibacterial activity and physical features of some nano metals and their oxides

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Abstract
In this paper, nanomaterials and their oxides have been prepared using a simple chemical mixing method for use as antibacterial agents (Staphylococcus aureus, Escherichia coli and Klebsiella pneumoniae). The synthesized nanoparticles were characterized using different techniques like FESEM, optical properties and XRD. The results of the composition showed that the nanomaterials had diameters ranging from (50-70) nm.

Absorption spectra and transition states for new organic dye sensitizers based on anthracene

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Abstract

Anthracene is the backbone of three suggested organic compounds in present work. Our calculations depending on DFT and TD-DFT take on B3LYP hybrid function using the basis sets 6-31g to carry out some properties at the ground state electronic and photovoltaic properties for the studied compounds. The relax structures show all the compounds have quasi planar conformation. The results showed that Homo and Lumo are little different, suggesting that be different structures play substantial characters to increase an electron acceptance. The result of(Lumo-Homo) gap and the voltage of open circuit are the factors operating to refining the quality for devices of solar cells. Furthermore, due to the high probability of the process for an electron injection of the organic structure in the TiO_2 conduction band, where the energy of maximum absorption and the wavelength are occur in the range spectrum of the solar.

Keywords: Open circuit voltage, Transition states, Molecular orbital character and energy gap.

Preparation of Polymer Nano-composite Materials to Sensing and Absorption Harmful Waves

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Abstract

In this study, prepared nano-composite materials to absorption and sensing harmful waves for human health, it made of polyester were prepared with a fixation hardener ratio of 0.1 g per 10 ml of polyester. This percentage was constant in all samples and addition of both chlorophyll(CLL) and lead oxide (PbO<100nm) as well as lead oxide with chlorophyll by weight percentage (0.2,0.5, 0.2 (CLL) with 0.5(PbO)wt.% receptivity, then study coefficient of loss of reflectivity of all samples where the results indicated that most prepared materials correct for use attenuation materials of microwaves where is the reflection coefficient of all samples larger than (10dB) this show that absorption of composite materials consistence larger than 90%, then study reflection coefficient and also definition complex permittivity in the range frequencies (3-5)GHz were observed that value of the complex permittivity larger than one($\mu_R > 1$).

Study of atomic properties for subshells of the systems have Z=12-16 by using Hartree-Fock approximation

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Abstract

The atomic properties are important to describe of the dynamics in atoms for the two-electron atomic systems studied in this work include the atom Mg , and like ions Al^{+1} , Si^{+2} , P^{+3} and S^{+4} ,Hartree-Fock approximation are used to determine the atomic properties like one electron radial density function D(r1)and its expectation value $\langle r_1^n \rangle$,inter electron distribution function $f(r_{12})$ and its expectation value $\langle r_{12}^n \rangle$, standard deviation for one and two electrons $\Delta r_1 \, \Delta r_{12}$, expectation values for all energies $\langle V_{en} \rangle, \langle V_{ee} \rangle , \langle V \rangle , \langle T \rangle , \langle E \rangle$

Key words*:* Hartree- Fock Method, two electrons radial density function, inter electron distribution function and its expectation values.

Measurement the uranium, radon and radium concentrations in urine samples for diabetics in Najaf city.

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Abstract
In this study, the total number of urine samples were 88 for diabetic patients and healthy controls in Najaf city of Iraq. Uranium, radium and radon concentration levels were estimated using CR-39 detector method. The samples have been grouped in two groups of 44 individuals each. The first group of urine samples were taken as 22 healthy controls and 22 diabetic patients from different regions of Najaf city. The second group were taken from Al-Ansaar region also as 22 healthy controls and 22 diabetic patients.
Results indicate the presence of uranium, radium and radon pollution in all urine samples for four groups. It was found that urine samples of Al-Ansaar area were more polluted with radiation than those of other regions in Najaf city. Also urine samples of diabetic patients were more polluted specially with radon than urine samples of healthy controls.
Keywords: Uranium, Radon, Radium, Urine, Diabetics.

Calculating of crystalline size, strain and Degree of crystallinity of the compound (HgBa$_2$Ca$_2$Cu$_3$O$_{8+\sigma}$) by different method

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 ABSTRACT: In this study the compound Hg Ba$_2$Ca$_2$Cu$_3$O$_{8+\sigma}$ was fabricated by RF-sputtering technique on the quartz substrate with a temperature of 100° C. The study of the diffraction of X-ray on The nature of the crystallizing of Hg Ba2Ca2Cu3O8+σ one Crystal system tetragonal structures. The Full width at half maximum (FWHM) was calculated by the Orange Pro program by using X-RAY data. The crystalline size and stress were calculated by Scherrer Williamson-Hall Halder-Wagner and size-strain plot methods Where the average of crystalline size and stress (54.5 nm 5.8 X 10^{-3}) respectively.and Degree of crystallinity was equal to (33.6%)

Keywords: Hg Ba$_2$Ca$_2$Cu$_3$O$_{8+\sigma}$ Williamson-Hall Halder-Wagner size-strain plot.

Computer Simulation of MPPT Converter to Control PV Panel-Battery System

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Abstract:

This research intends to build and simulate a small renewable energy system consists of PV panel, lead-acid battery, and bidirectional DC-DC converter. Bidirectional Buck-Boost converter was used to regulating the voltage and current coming from the solar panels going to the battery and vice versa. It operates a Buck converter which charges the battery from the PV panel when State of charge (SOC) reaches less than 0.4. The battery needs 100 ms to charge from 12.2 V to 13 V with duty cycle 0.5 and 1 A. Also work as a Boost converter when SOC reaches 1 the battery was discharge for 100 ms and SOC decreases from 1 to 0.4.

A PSPICE PV panel model (consists of 20 solar cells, 12 V and 60 W maximum power at 25 ^{0}C with 1000 W/m^2 solar irradiation) has been used as a source of energy to the power circuit. The output of PV panel relates to Boost converter, which is the key for changing the PV's terminal voltage to track the maximum power, it was rising a PV panel voltage from 10 V to 22 V for all variation of surface temperature from 300 K to 350 K at frequency 10 kHz and $\Delta Vo = 1.1$ V.

Keywords: PV system, DC-DC converter, Lead-acid battery, and PSPICE.

Evaluation of (Ni, Cr, Cu) Concentration in the Soil of Diyala Utilizing GIS Techniques

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Abstract. The investigation of pollution's elements were become the hot topics for the researchers. The current work aims to evaluate the concentration of some heavy elements Copper, Nickel, and Chrome (Cu, Ni, Cr) respectively. The study area of this research is Diyala province / Iraq. The base approach for this work is collecting 25 samples of soil to be studied. The samples were collected from (industrial, residential, agricultural) areas, with an average sample rate for each region with a depth (20 cm). After collecting the samples, they were sorted and compressed to prepare them for measurement by dispersive X-Ray Fluorescence. Analysis after obtaining the results, they are compared with the global determinants (WHO). Through these results, we find that a noticeable increase in the element (Ni) in Aleazim corking Khanaqin, Al-Rashidiya and Mohammed Sakran, while the highest concentration of (Cr) was recorded in jadidat alshat, Najana, Al -Rashidiya and Diyala Bridge. The (Cu) concentration was recorded high in the Aleazim Dam regoin, Aleazim, Muqdadiya, hayi Mezid, Al-Khalis, Rashidiya, Mohammed Sakran and Diyar Bridge. The residential and industrial areas were indicated an increasing in concentration of the investigated elements, while the areas with good vegetation have the lowest concentrations of these elements.

Keywords: Cu, Ni, Cr, heavy metals, soil.

Finding Bulk etch rate VB using the maximum value of the Lmax effect using practical diameters calculated from the falling alpha particles on the CR-39 nuclear track detector.

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Abstract
A lot of research was focused on studying the engineering shape of the impact and its development and finding its parameters. It was based on pictures of the side effects of the effects formed in the detector as a result of the detector's etching. Obtaining pictures of the side effects of the effects to measure their lengths is a difficult process compared to its diameters. There are many methods used to find Bulk etch rate V_B including gravimetric method or thickness difference; but we will use in this research an alternative method to find VB which is the maximum value method for saturation of the effect length "Lmax-method". Using the source Am241 (1μCi) emitting alpha particles in irradiation of the PDAC CR-39 irradiation With MeV energies (2.3,3.3,4.3), the detectors etching by NaOH aqueous solution at different concentrations (N: 6,7,8) at a temperature of 70 ± 1 ^{o}C, we suggested in our research a D-Le calibration method that is based on direct experimental measurement of the diameters of the projected effects in Detector instead of lengths. An empirical relationship was used to find VB, which depends on the maximum values of saturation of effects lengths and their saturation times. The results we obtained for V_B values at the concentrations used were (1.199,1.490,2.184) μm h^{-1} in order and they correspond well to the values resulting from different methods, it is observed The Bulk etch rate increases with the concentration of the abrasive solution, and the maximum values of saturation of the effect length are directly proportional to the energy of the bombing particles and the time of saturation of the impact lengths.

Diffraction patterns and nonlinear optical properties of Nanocomposite (Gold nanoparticles / Epoxy resin polymer)

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ABSTRACT:

We observed and analyzed diffraction rings produced by CW Nd: YAG visible laser beam in a nanocomposite of gold nanoparticles doped by epoxy resin polymer. Change of refractive index, Δn, and nonlinear refractive index, n_2 were calculated based on the number of rings observed. A thermal effect is due to this major nonlinearity. With rising input power and sample thickness the number of rings increases. Spot diameter of rings was calculated and noted it increase wih input power increasing and decreasing thickness of sample.

Exploring frequency effects in chaotic semiconductor laser

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Abstract

The issue related to the chaos control in semiconductor laser has drew attention. The resonant perturbations have been of high importance with regard to the harnessing non-linear oscillators for different applications including inducing chaos as well as controlling chaos. Interesting results have been obtained regarding to the effect of the   chaotic resonance by adding the frequency on the chaotic systems. The forcing frequency changes nonlinear dynamical system via critical value, there has been transition from periodic attractor to strange attractor. The experimental studying for the evaluation of chaos modulation behavior are considered in the case when frequency related to external perturbation has been changed, whereas the amplitude related to such perturbation has been fixed. This dynamic regarding laser output have been analyzed by time series, the FFT as well as the plot diagram as a result of this data.
 Keywords: Chaos, Frequency, chaotic resonance .

Erbium yttrium aluminum garnet (ER: YAG) for acne lesion treatment

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Abstract
 ER:YAG laser wavelength (2940 nm) was used to treat acne scars of a different type. The laser is   stronger   than   Nd: YAGor   IPL.Through,   the   use   of the procedure,   the laser beam is late engaged by the skin, particularly those lasers in superficial t reatment Hence there are several different characteristics related to the layer of the skin, such as stimulating the skin. The review article is about technique.

Keywords: Acne –technique-scar-layer

Image Classification Schemes Based on Statistical Moments of Wavelet and Sliced Radial Energy Distribution of DCT

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Abstract

Texture recognition is used in various pattern recognition applications and texture classification that possess a characteristic appearance. This research paper aims to provide an improved scheme to provide enhanced classification decisions and to decrease processing time significantly. This research studied the discriminating characteristics of textures by extracting them from various texture images using discrete Wavelate transform (DWT) and discrete Cosine transform DCT. Two sets of features are proposed; the first set was extracted using the traditional DCT, while the second used DWT. The features from the Cosine domain are calculated using the radial distribution of spectra, while for those extracted from Wavelet was statistical distribution of various relative moments. Four types of Euclidean distance metrics were used for classification decision purposes. The considered method was applied on 475 classes of textures belonged to 32 sets from Salzburg Texture Image Database, each set holding 16 images per class, so the a total of 7600 images were tested. Each image was separated into three bands of color component (i.e., red, green, blue). Concepts of average and standard deviation were calculated to determine the inter/intra scatter analysis for each feature to find out the best discriminating features that can be used. The final result of DWT was 99.98 for the testing sets and 99.71 for the training sets, while the final result of DCT was 99.06 for the testing sets and 96.77 for the training sets.

Image Classification Schemes Based on Gradient Matrix and Contrast Matrices

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Abstract

Texture classification and categorizing are used in various pattern recognition applications and classification texture that possesses a characteristic appearance. This work aims to provide an improved scheme of enhanced classification decision with the need to increase the precision time significantly. This research studied the discriminating characteristics of textures by extracting the feature from gradient matrix (GM), the features were extracted using the first-order gradient feature vector, three Gradient Matrices were established, one for Max value, another for Min value and last was the Average value, these matrices were calculated by extracting the gradient along x-axis and y-axis and the gradient along the diagonal. A feature vector consist of 210 features was calculated to represent each image sample and contrast matrix CM, The feature extracted from CM1 was The difference between the sum of the neighborhood values of 3x3 pixels those larger than the pixel values (center pixels) divided by their number and the sum of the neighborhoods values of 3x3 pixels those smaller than the pixel value divided by their number total feature vector was 210, Four types of Euclidean distance metrics were used for classification decision purposes. The concepts "average" and "standard deviation" were calculated to perform the inter- entra scatter analysis for each feature to find out the best discriminating features that can be used. The final result of the test set of GM is 98.3 while training set was 97.3, the final result of the test set of CM is 98.2 while training set was 95.7.

The effect of changing the wavelength on some of the optical properties of copper nitrate water

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Abstract

In this work, some of optical properties for (Cu(NO3)2.6H2O), such as (transmission , reflectance, absorbance , damping coefficient, refractive index, Brewster angle and critical angle) have been calculated with $(0.1- 0.9) gm/ml$ concentration at (242,449,631,978) nm wave length at 250c . the results showed the optical properties were increased with concentration and wave length have been used , except transmission and critical angle which decreased with the same concentration and wave length when as, the same optical properties have higher values , while the transmission and critical angle were decreased at the case wave length .

Indicators of Community participation in master plan

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Abstract:

The community participation process is a key party in the plan development and success process, so the local community should have a say in building the master plans for their cities and they have the authority to make decisions. In this research, we will get acquainted with the city of Diwaniyah, the study area, and to determine its boundaries and the master plan for it., and analyzed its results using statistical methods that relate to planning indicators extracted from the conceptual framework and previous studies. A specialist distributed to the Urban Planning Directorate (11), the Diwaniyah Municipality Directorate (23) and the Governorate Bureau (17). The results of the research and through the statistical analysis of the answers in the questionnaire using the statistical program (SPSS) statistical package for social since and statistical comparisons that showed the existence of high importance and reliability of the axis of community participation in the planning process, The research also concluded that community participation is an influencing process in the master plan of the city, and the study recommended a set of recommendations, including: giving powers to the decision-makers responsible for the master plan, in order to enable them to participate effectively in the master plan, with the need to provide these local institutions with planning cadres with specialists in urban planning and community participation.

Keywords: Al-Diwaniyah city center, community participation, master plan.

The Judd Ofelt Spectroscopic analysis for Ho^{3+} doped with SiO$_2$

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Abstract

Holmium ions Ho^{3+} Doped with Silicon dioxide was synthesis with help of wet chemical process. Techniques such as UV- Visible spectroscopy and fluorescence spectroscopy were used to investigate the spectroscopic properties of of Ho^{3+}:SiO$_2$ sample. The Judd-Ofelt theory is used to achieve of the spectroscopic properties to prepared sample and calculates the three Judd-Ofeltt of parameters; Ω_2, Ω_4 and Ω_6. From the obtained parameters, the A(J;J'), τ_{rad} and $\beta_{J \to J'}$ are calculated. Depending on the suitable value of A(J;J'), τ_{rad} and $\beta_{J \to J'}$ it could suggests to use Ho:SiO2 as Laser active medium.

Keywords: Sol- Gel; Spectroscopy; S i O $_2$; Judd-Ofelt

Uranium Concentrations in Urine of Maternal Samples in Baghdad Governorate

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Abstract

The trace concentration of uranium in urine samples for pregnant women and non- pregnant women were determined using fission track technique with CR-39 track detector that is employed for registration of induced fission tracks. A total of 32 urine samples were collected from Yarmouk Teaching Hospital, Department of Obstetrics and Gynecology for Pregnant women and 5 urine samples were collected from Different regions of Baghdad governorate. The results show that the uranium concentration in urine of Pregnant women were ranged from 0.58 µg/l (30 years old, living in AL- Shurta AL khamisa region) to 1.58 µg/l (23 years old living in AL–Doura region) with average 0.92±0.2 µg/l. While for non-Pregnant women, uranium concentration ranged from 0.61 µg/l (24 years old, living in AL-Doura region) to 1.16µg/l (40 years old, living in AL-Ghazaliya region) with average 0.874±0.19µg/l. It was found that the average uranium concentrations in urine samples for pregnant women living in Hayi AL-maealif region higher than other regions in Baghdad governorate.

Key words: Fission Track Technique, CR-39 track detector, Pregnant women, Urine sample, Uranium concentration.

Determination of radon gas concentration ^{222}Rn from rock models of selected oil wells from Basra oil fields - Iraq

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 Abstract

   In this study, 56 rocks samples were taken from 8 welled oil wells from the oil fields in Basra Governorate - southern Iraq at deep depths of up to 3500m from the surface of the earth, to determine radon gas concentrations ^{222}Rn emitted from the models of oil wells rocks. The Rational Application Developer (RAD7), an active measurement method, used rapid electronic technology. The results of this study showed that the largest concentration of radon gas in oil well rock (Rocks) is 53861Bq.m^{-3} in a rock sample at a depth of 3500 m from the Ru-205 well in the southern Rumaila oil field and the lowest concentration is248 Bq.m^{-3} in the rock sample. From WQ-94 well in West Qurna field. The effective annual dose that oil workers can be exposed to upon contact has been calculated to the highest concentration of radon gas 107.772 μSvh^{-1} which is higher than the permitted dose level 50 μSv h^{-1} proposed by the EPA in the United States, and may pose risks to the health of workers in Oil Fields, and therefore, measures must be taken to preserve the health and safety of workers. The possibility of developing cancer as a result of exposure to radon gas per million people was found to be high compared to the permissible limits (170-230) per million people previously.

Key words: rocks, oil wells, radon gas ^{222}Rn, RAD7 device, effective annual dose, Cancer.

Effect of molecular weight on electro – optic switching times of liquid crystal polymer doped with cobalt oxide nanoparticles

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Abstract

Nonlinearity liquid crystal cell which doped with Ferroelectric nanoparticles characters studied in this paper according to their eclectic absorption. Polysiloxin series with side chain liquid polymers used with side chain polymers and molecular weight ran This study consternate on polymers electro.optic characteristic with various molecular weights by using the mesogenic units and a stable   polysiloxane .

Suspension sensitivity or Electro-visual response to the mark of the used electric field, a real character to electric liquid crystals. The addition of Co3O4, nanoparticles to polymer rise dielectric anisotropy and minimize response times. It observed   that the voltages rises with molecular weight rising , and when intensity value rise we gain voltage operating .

Spectrometer used infrared measurements to locate   the orientational order parameters, ($\bar{s}$) for liquid crystals with a side series. The orientational order parameters ($\bar{s}$) rely on temperature with various molecular weights and the threshold voltage.

Key words : cobalt oxide nanoparticles, polymer Poly-siloxane, electro – optic response.

Microscopic Description of ^{170}Er, ^{172}Yb, ^{174}Hf, and ^{176}W Isotones

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Abstract

The properties of ^{170}Er, ^{172}Yb, ^{174}Hf, and ^{176}W isotones have been studied and their energy states calculated. To identify the properties of each isotone, the values of the first excited states, $E2_1^{+}$, and the ratio of the second excited states to the first excited states, $R_{4/2} = E4_1^+/E2_1^+$, for all nuclei under consideration were adopted. To determine the properties of each nucleus, the relationship between the moment of inertia $2\vartheta/\hbar^2$ and the square of the angular frequency, $\hbar^2\omega^2$, the relationship between successive excited states to those preceding them $r\left(\frac{I+2)}{I}\right)$ and the $\Delta I = 1$ staggering between the GSB and the NPB states were studied for all states of ^{170}Er, ^{172}Yb, ^{174}Hf, and ^{176}W isotones. After identifying the properties of each isotone, the rotational limit in the interacting boson model IBM-1 and the IVBM model was used to calculate the energy states for each isotone and the results were compared with the experimental values. and good agreement was observed with some exception. The inaccuracy of some calculations in the IBM-1 results from the lying of some high states out the range of the rotational properties that were used.

Keywords: ^{170}Er, ^{172}Yb, ^{174}Hf, ^{176}W isotones properties, IBM-1, IVBM.

Synthesis and Characterization of Copper Ferrite Nanoparticles

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Abstract
Copper ferrite $CuFe_2O_4$ nanoparticles were synthesized by sol-gel method with different annealing temperatures (200, 450, 650 and 850) °C. Structural, morphological, magnetic and electrical properties were studied using X-ray diffraction (XRD), transmission electron microscopy (TEM), field emission scanning electron microscopy (FE-SEM), Fourier transform infrared spectroscopy (FT-IR), vibrating sample magnetometer (VSM) and LCR meter . The XRD patterns showed the system structure in Cu-ferrite had deformed at 650 °C from a cubic to a tetragonal system with apparrent a secondary phase CuO. Lattice constant decreases with increasing annealing temperatures, while crystalline volume increases. The FT-IR spectrum of sample under investigations shows two significant absorption bands, which refer to the formation of a single-phase cubic spinel. Magnetization revealed a soft ferromagnetic behavior for the composition sintered at 850 °C. The saturation magnetization, remnant magnetization, and coercivity were 32 emu.g^{-1}, 11.64 emu.g^{-1}, 517.16 emu.g^{-1}, respectively. The electrical measurement of sample shows decrease in the real and imaginary part of dielectric constant with increasing frequency   while and AC conductivity increasing .

Keywords: Copper ferrite, Magnetic properties, dielectric properties

Physical Properties of Rhodamine 6G Laser Dye Combined in Polyvinyl Alcohol films as Heat Sensor

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Abstract

Rhodamine 6G- polyvinylalcohol (Rh6G /PVA) films were prepared via casting route at room temperature with different volume of Rh6G dye solution (5, 10, 15, 20, 25 and 30 ml). The optical properties of as-prepared films were characterized using UV–Vis spectrophotometer at a wavelength range of 200-800 nm. The absorption peak of the pure PVA film does not affect by adding the Rh6G dye solution while exhibited increase in intensity of the absorption spectrum. Furthermore, the absorption peak of Rhodamine 6G demonstrated red-shift about 10 nm. Energy band gap slightly affected by adding Rh6G dye solution. The amazing influence of heat treatment on the physical properties of Rh6G/PVA films appeared due to red-shift and decrease the energy band gap. The results exposed that the best sensitivity calculated at temperature 40 $^{\circ}$C for as-grown Rh6G (15 ml) /PVA film around 35.74%.

Guided Modes in Slab Waveguide with Central Anisotropic Metamaterial Layer

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Abstract

This work studies the characteristics of *TE* modes in a three layers slab waveguide that contains an anisotropic metamaterial as a central layer. The results show that all modes except TE_1 achieved forward propagation and then turned backwards. The effective refractive index value at which the propagation type is reversed increases with the mode order and the thickness of the middle layer. In addition, an anisotropic property in the metamaterial layer shift the modes curves (exept TE_1) to left or right with respect to the isotropic case. Furthermore, the mode TE_1 is abnormal and inconsistent with the behavior of other modes. Except TE_1 mode, the confinement factor is small in the forward propagation region and reaches large values in the backward propagation region.

Keywords: slab waveguide, metamaterial, guided modes.

Influence of wood minutes (reed) on some physical and mechanical characteristics for (EP+W) composites.

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Abstract

By using agricultural wastes, the epoxy composites were prepared with reed minutes and with a fixed weight fraction of all samples (30%) and a particle size (212) µm. Preparation of samples carried out by using the casting method. Some mechanical properties have been investigated were included (tensile strength, bending, creep) and the results showed improvement of all properties through increased bending resistance and elasticity increased with epoxy reinforcement with wood particles. The intent of this research is to enhance the mechanical properties by adding agricultural wastes that represented by (reed).

Key word: physical and mechanical characteristics, Epoxy resins, reed.

Studying the effect of doping by Ag on the structural and optical properties of a-As$_2$Te$_3$ thin films

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Abstract

a-AS$_2$Te$_3$ was made of high purity elements that were productive. Thin film at a thickness (400 nm) was prepared using thermal evaporation techniques on cleaned glass substrates under very low vacuum (2×10^{-5}mbar) with precipitation rate (0.33nm/s). The X-ray diffractometer showed that the pure film structure was amorphous, and the doping sample structure as polycrystalline. The result of optical properties has shown that pure and doping films have allowed a direct optical energy gap, and the energy gap for the pure film is (1.25eV) and decreases whenever we add impurities.

Keywords: a-AS$_2$Te$_3$ thin film; optical properties; amorphous chalcogenides

Study of background radiation in soil and water samples from many regions from Al-Fallujah city

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Abstract: The study of the radiological background calculation, by characterizing the radio nuclides and calculating their specific efficacy in the environment of the city of Fallujah (water and surface soil), using the nuclear impact detector technique in the case. Seven samples of water were collected using the system (GBS). Determine the concentration of uranium accounts based on comparison with standard models were used detector nuclear impact (CR-39) as a method for the detection of uranium in soil samples for study. The specific efficacy rate of the radon-222 antibody was very close to that of other studies. Knowing the level of natural and industrial radioactivity in the environment of the city of Fallujah using appropriate and different nuclear analysis methods and comparing the results of the measurements with the radiation ackground, which was previously studied and proved to be a radiation background. The results of radioactive material from the soil and water samples record the highest rate of uranium concentration in comparison with the standards reference of**(ICRP)** (International Commission Radiation Protection. The highest of background radiations of those regions were suffering of military operations. The total mean dose rate of the surveyed areas is found to be roughly thrice that of the world average, and found to be higher than that of other places compared with except .The Results of Solid State Nuclear Track Detector (SSNTD) measurements of natural radioactivity using contact autoradiography for the determination of uranium and non-contact autoradiography for radon emanation are presented.
Keywords: Uranium Concentration, Contamination, Soil,water, CR-39 Detector.

The effects of X-ray on the radii of Red Blood Cells

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Abstract

X-ray could be used in different useful purposes either diagnostic or therapeutic. However, the living tissues such as blood can be negatively affected with the ionizing radiation like X-ray when the body was exposed. The irregularly effect can involve the mechanical features of RBCs like shapes and radius which represent the main factors in functional performance of RBCs. Thus, any defect in these characters could lead to lose the RBC roles. Our study aimed to find the morphological changes of RBCs when they exposed to X-ray by measuring the radii using He-Ne laser technique. Three blood groups; O, AB and A, were exposed to different X-ray doses; 60, 80, 100 and 120 Kilo Electron Volt (KeV) for 1 minutes and the radius was checked after applying low power laser beams which was previously used for accurate measurement to the RBC radius compared to biological measuring techniques. The results showed that the radii of fringes (r) of irradiated RBCs for the tested groups were smaller than that of non-radiated RBCs for all X-ray doses. The radii of fringes (r) directly and significantly increase with increase the distance between the slide and screen (D). Radii of the tested RBC (d) groups were significantly altered compared to control groups which could relate to impairment of sodium and potassium pump mechanism which can lead to loss the RBC membrane permeability. Thus, RBCs uptake or loss the materials and liquids resulting in decreasing or increasing their sizes.

Keywords: Red blood cells radius, RBC membrane, X-ray, irradiation

Track parameters investigate of oblique incident of alpha particles irradiated CR-39 detector

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Abstract

In this work, the track etch-rate V_T and etch-rate ratio V of CR-39 detector irradiated by alpha particles was investigated at different incident angles. The change of the track etch-rate and etch-rate ratio along the particle trajectories showed that these functions are not affected by the inclination of the particle trajectory with respect to the normal on the detector surface.

Keywords: Oblique incident; Track etch-rate; Alpha particle; SSNTD; CR-39 detector.

Construction of Scaffold from MgO Nanoparticle: Bone Fracture Healing

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Abstract:

Magnesium oxide nanoparticles have been prepared by using chemical method. The chemical analysis of the samples was carried out using EDX measurement. The results showed that all the samples are very pure, consisting of the elements of magnesium and oxygen. XRD pattern of MgO nanoparticles prepared at a different temperature (500, 550 and 600 ^{o}C) and 3 hour time. It is seen that the peaks appear at $2\theta=36.92$ degrees, $2\theta=43.02$ degrees, $2\theta=62.38$ degrees, $2\theta=74.56$ degrees and $2\theta=78.48$ degrees, reflective planes reflect (111), (200), (220), (311) and (222), respectively. Scanning electron microscope of treated magnesium oxide at different temperatures was carried out. As the result showed that magnesium oxide have spherical nanoparticles in diameters ranging from 15-20 nm, systematically distributed. Histopathological evaluation showed the thick mature threads and anatomizing bone threads filled interface zone in MgO scaffold prepared at different annealing temperatures.

Keywords: *MgO, Scaffold, nanoparticle, Bone fracture healing.*

Electron, Proton, and Alpha Stopping Powers of Polyvinyl toluene (PVT) Scintillator Crystal

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Abstract

The stopping powers of electrons, protons, and alpha particles incident with different energies on polyvinyl toluene (PVT), which used as a crystal in scintillator detectors, have been calculated using the codes of National Institute of Standards and Technology (NIST). For electrons, the collision and radiative stopping powers were calculated and for protons and alpha particles, the electronic and nuclear stopping powers were investigated. The behaviors of the calculated stopping power have been studied and explained. The obtained results strongly suggest that if one used PVT as a detector crystal, they must be shielded against tested particles.

Keywords: Stopping Power; PVT; Scintillator Crystal; Electron; Proton; Alpha

The Effect of Form Factor Shape on the Nuclear Stopping Power of Calcium, Iron, Zirconium, and Lead Elements

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Keywords: Nuclear Stopping Power; Form Factor; Ca; Fe; Zr; Pb

Abstract
This paper examined the effect of the form factor of the nucleus and its type on the nuclear stopping power of Ca – 40, Fe – 56, Zr – 90, and Pb – 206 isotopes, respectively. The collision, radiative, and total electronic stopping power of these elements was also calculated. The results of the electronic stopping power showed that the collision part exceeds the radiative up to a specific energy that depends on the element's atomic number, after which the electronic stopping power will prevail. As for the nuclear stopping power of electrons, the results indicated its great dependence on the form factor of the nucleus, but this dependence begins at a specific energy for each studied isotope and this energy changes with the isotope change. Also, the results did not show distinct significant differences between the different types of form factors, which are exponential, geometric, and uniform. On the whole, the results of the nuclear stopping power containing the exponential form factor are decreased by increasing the mass number of the isotopes. Finally, the behavior of the electronic and nuclear stopping powers as a function of the incident electron energy of the studied elements and isotopes behaved like what is expected and known.

Optical Limiting Properties of Nano-composite Gold Nanoparticles / Epoxy Resin

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ABSTRACT:

In this paper, We prepared nanoparticles using the Turkevich process. The characterization of gold nanoparticles is carried out using a Scanning Electron Microscope (SEM). Linear optical properties studied by UV-visible Spectroscopy. Investigation of the optical limiting properties (OL) of nanocomposite (AuNPs / Epoxy resin) at different thicknesses (2.5, 9, 10.5, 14.3, 20.5, and 34) µm is performed. The threshold and optical clamping were calculated from optical limiting operation implemented by the Z-scan technique using CW Nd: YAG laser at (532 nm). The samples showed low optical limiting thresholds, which can be demonstrated by the strong absorption of the two photons in these samples. The nanocomposite displays the lowest optical limiting threshold (66 mW) at a thickness (2.5) µm. We notice that the nonlinear light-induced absorption results in an optical limited.

Effect of Gamma Irradiation on the Physical Properties of PVA Polymer

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Abstract
Polyvinyl alcohol (PVA) films were prepared by casting method. The optical properties was measured in the wavelength rang of (200–900) nm, by using UV-visible spectroscopy. The effect of irradiation lead to degradation on the physical properties such as absorbance, transmittance, refractive index, extinction coefficient in addition of the real and imaginary part of dielectric constant was studied. This study reveals that all these parameters affected by the increasing of them irradiation, and also found that the optical energy gap has been increased with the increasing of the irradiation. The structural properties are studied by using XRD, FTIR spectrum, and FESEM.

Key Words: optical properties, structural properties, effect of gamma irradiation, PVA polymer.

Synthesis SnO_2:Bi_2O_3 Nanostructure Device for Bio Sensor

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Abstract:
SnO_2:Bi_2O_3 colloidal NPs were synthesized by pulsed laser ablation of Sn:Bi target (50%:50%) in double distilled water (DDW) at room temperature. High purity Sn:Bi target (purity of 99.99%) was fixed at bottom of open a plastic cell containing of 2 ml DDW and DDW+ PVP which represent the liquid media. Ablation is carried out with laser operating at 1.064 nm wavelengths at flounce set in the range of 40.5J/cm^2 and (60 laser pulses). The diffraction peaks in the XRD pattern broadened due to the particles in the sample are too small. The primary particle size calculated by Sherrer formula is about 150 nm. The spherical nanoparticles morphologies were carried out by scan electron microscope (SEM) analysis, exhibits spherical with average size distribution found to be 20 nm.
Keywords: SnO_2, Bi_2O_3, Piezo- sensor, Laser ablation.

Radiation hazards and transfer factors of radionuclides from soil to plant and cancer risk at Al-Taji city-Iraq

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Abstract. The concentrations of natural radionuclides in various common plant species grown in the city of Al-Taji in the capital, Baghdad, were examined using NaI (Tl) gamma spectroscopy. The measurements were made on three parts of each plant sample which included roots, stalk, and leaves in addition to soil. The assessing of transport factors shows the K-40 transfer coefficients were lower than those values mentioned in other previous studies. The mean concentrations of specific activity for U-238, Th-232 and K-40 in the basil plant were 4.455±2.944, 18.774±14.998 and 123.767±23.047 Bq/kg respectively. For celery it was 3.904±3.326 Bq/kg, 32.899±6.739 Bq/kg, 85.032±35.650 Bq/kg. As for mint, it was 2.233±4.337 Bq/kg, 25.354±8.696 Bq/kg and 92.115±33.070 Bq/kg. The results showed that the concentration of uranium, thorium and cesium did not exceed the permissible limit. Potassium concentrations will not exceed the internationally permitted level in all parts of plants under study. The radium equivalent activity was 70.527 Bq/kg less than 370 Bq/kg recommended by UNSCEAR. The maximum absorbed dose rate in soil samples was 58.205 nGy/h, which is less than 84 nGy/h. Whereas the average annual effective dose equivalent in soil samples was 285.535 mSv/y which are less than the 290 mSv/y recommended by UNSCEAR, Respectively. The maximum hazard risk index was 0.214 in soil samples and is less than ≤1 recommended by UNSCEAR. The lifetime cancer risk (ECLR) ranged from 142.620×10^{-3} to 999.372×10^{-3}. This value is above the global average of 0.29×10^{-3} and 1.16×10^{-3} reported by UNSCEAR. The lifetime cancer risk is a function of environmental geology and the K-40 soil transfer factor to the plant is very high compared to other radionuclides in the samples. Therefore, there is a risk from its management.

Keywords: Natural radioactivity, Transfer Factor, soil, plant, radiological hazards, Al-Taji

Structural Morphology and Optical Properties of Nanocomposites based Conducting Polymer

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Abstract: A simple, inexpensive, pulsed laser deposition (PLD) technique excimer source Nd:YAG laser was used for the preparation of the all films irradiation targets and deposite of nickel oxide NiO, polypyrrole PPy, carboxylic functionalized multi-walled carbon nanotubes (f-MWCNT), [PPy:(f-MWCNT)] nanocomposite, [NiO/PPy:(f-MWCNT)] and [PPy:(f-MWCNT)/NiO] films on fluorine-doped tin oxide (FTO) substrates. Surface morphology of all films and nanocomposite was investigated by Scanning Electron microscopy (SEM) display various morphology on the surface of the all films and nanocomposites, but the predominant structure is granular morphology, x-ray diffraction (XRD) indicates that the peaks of all films are broadening expect for PPy are sharp peaks, the optical absorbance spectra for the studied all films showed the maximum values around (425, 333, 347, and 397) nm refer to type transitions (π^*-π) and (polaron-π^*) and the maximum value of NiO around 346 nm. The optical energy gap of all films was determined and values around (2.2, 2.6, 2.8, 3, 3.2) eV. It has been observed that the measurements for films [NiO/PPy:(f-MWCNT)] and [PPy:(f-MWCNT)/NiO] may be identical and NiO nanoparticles are a good adhesion to nanocomposite films and interconnected in structure.

Keywords: Polypyrrole, functionalized Multi-walled carbon nanotubes, nanocomposites , (PLD) technique, films deposition, nickel oxide.

Electron Stopping Powers of Chitin and Chitosan

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Keywords: Stopping Power; Electron; Chitin; Chitosan;

Abstract
Chitosan can be deduced from chitin by simple chemical process. Chitosan has many applications and one of the promise application is used as nuclear shield by adopted it with some materials. Electron stopping power (SP) represents important parameter in tested the ability of any material to use it as nuclear shield. Therefore, stopping powers of electrons incident with different energies on chitin and chitosan have been calculated by using codes of National Institute of Standards and Technology (NIST) after modified it by built in the chemical structure and some other properties of chitin and chitosan in the codes. The results of total SP showed that chitosan has values larger than chitin but the differences are small and the maximum percentage difference ratio is 6.8% at 4 MeV electron energy. Total SP has approximately 35 Mev.cm^2/g at 0.01 MeV electron energy, and decreasing with energy till to 1 MeV, then slowly increasing. In addition to total SP, the collision SP, radiative SP, density effect parameter, radiation yield, and electron range were calculated. The behaviors of the calculated parameters have been studied and explained. The obtained results suggested that chitosan may be used after mixing it with other materials as a shield from nuclear radiation, especially in low energies.

Improve the Performance of Porous Silicon for solar application by the embedding of Lithium Oxide nanoparticle

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Abstract. The present research concerns the manufacture of porous silicon (PSi) by means of electrochemical etching method at (10 mA.cm^{-2})current density and approximately 10 minute etching time. The porous silicone layer was investigated by XRD, AFM and FTIR, and then Li$_2$O nanoparticles (NPs) were prepared by a simple chemical method. And freshly embedding three drops of (Li$_2$O) solution using the drop casting technique on the 40°C porous silicon(n-Psi) method to produce the heterojunction Al / Li$_2$O / PSi / Al. The results of current-voltage (I-V) test showed that the solar cell 's maximum power conversion efficiency (PCE) was 2.49% and thus the fill factor was 66.12%. A diffusion of Li$_2$O NPs on PSi solar cell characteristics assures an improvement on their properties.

Keywords: Porous silicon, Li$_2$O NPs, Electrochemical etching, XRD, solar cell.

Assessment the Heavy elements in Policemen's Serum using FAAS

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Abstract: Determination of lead, cadmium and nickel concentrations in serum samples (n=50), collected from policemen at difference checkpoint in Karbala governorate, was carried out by flam atomic absorption spectrometer. The results show, that the Pb, Cd and Ni mean value were (1.016 ± 0.052)ppb, (0.043 ± 0.007)ppb and (0.212 ± 0.015)ppb respectively. The result also show that the mean values of heavy elements in serum samples were higher in policemen group when compared to control group, where the statistically significantly difference $(p<0.05)$, except for Ni were statistically non-significantly difference $(p>0.05)$.

Keyword: Heavy element, atomic absorption spectroscope, blood, serum.

Photoluminescence, Optical Energy Gap and Electrical properties of Mn-Doped ZnO Nanorods Synthesized by CBD Method

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Abstract
In this work, un-doped and Manganese doped Zinc Oxide Nanorods (NRs) thin films were grown on the glass substrates using chemical bath deposition method (CBD) at 80 °C temperature. The effect of Mn content (0, 2 and 4%) on the structural, morphology, optical and photoluminescence characteristics of ZnO NRs films was investigated. The XRD patterns of un-doped and Mn-doped ZnO NRs demonstrate sharp and strong peaks together with high crystalline structure. The FESEM images showed that the nanorods of ZnO and Mn:ZnO were well-aligned and distributed throughout the films. The absorption edge was observed to be blue-shifted and the optical energy gap was found to be widening from (3.21, to 3.31) eV with increased Mn content. The photoluminescence spectrum (PL) of Mn-doped samples was examined, at room temperature, and revealed of highly UV emission, whereas the green-yellow wavelengths emissions were enhanced with increased Mn content. Current-voltage (I-V) characteristics showed that the photocurrents of all prepared samples are enhanced and the Mn doped samples showed a good response, under UV light.

Keywords: Mn dopant; ZnO Nanorods; CBD method; Photoluminescence; I-V characteristics.

Sensing Characteristics of Nanostructured PANI/Ag Thin Films as H$_2$S Gas Sensor

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Abstract: Nanocomposites of polyaniline (PANI) and Silver (Ag) nanoparticles (NPs) have been successfully synthesis using hydrothermal and chemical method respectively. The nanocomposite films were deposited by spin coating technique on Si substrates and examined using XRD, FE-SEM, EDX, FT-IR techniques as well as their sensing properties were studied towards H$_2$S gas. The XRD pattern showed a presence of crystalline nature of PANI NFs film and cubic structure of PANI/Ag films. FE-SEM images revealed that PANI film has nanofibers structure, whereas the PANI/Ag films composite revealed that Ag NPs caped with PANI nanofiber. The sensing analysis indicated that on exposure to H$_2$S gas at low concentration 25 ppm, it was observed that the PANI/Ag films sensor composite showed high sensitivity compared with pure PANI NFs, and the maximum sensitivity (73.35%) was obtained at 200 °C with faster response/ recovery times < 1 sec.
Keywords: Polyaniline NFs, PANI/Ag composite, hydrothermal method, H$_2$S gas sensor spin coating.

Pre-Equilibrium Differential and Double Differential Cross Sections of Neutrons Induce Nuclear Reactions in ^{64}Zn Nucleus

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<u>**Abstract**</u>:

The pre - equilibrium and equilibrium differential and double differential cross sections have been calculated for 2MeV neutrons induced reactions in ^{64}Zn nucleus using Kalbach Systematic approach in terms of Exciton model with Feshbach, Kerman and Koonin (FKK) statistical theory. The two-component exciton model and some corrections have been implemented in the calculation the particle-hole state density. In this work, Isospin, finite well depth, and shell effects are considered. The obtained results were compared with the available published experimental and theoretical data that in the international libraries such as TENDL, ENDF, and JEFF. The comparisons with these available data showed an acceptable agreement especially for the reactions: ^{64}Zn(n,n)^{64}Zn, ^{64}Zn(n,p)^{64}Cu, ^{64}Zn(n,D)^{63}Cu, ^{64}Zn(n,T)^{62}Cu, ^{64}Zn(n,^{3}He)^{62}Ni, and ^{64}Zn(n,^{4}He)^{61}Ni at different emission angles.
Keywords: Cross section; exciton; FKK model; Kalbach; pre-equilibrium

Perovskite solar cells based on $CH_3NH_3SnI_3$ Structure

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Abstract: In recent years, organic-inorganic perovskite solar cells have attracted considerable interest in the photovoltaic research community because of its ease of processing, low production costs, super light-harvesting characteristics, and relatively high performance, making it more desirable than other current solar cell materials. Lead-based perovskites ($CH_3NH_3PbX_3$, X= Cl, I, Br) solar cells have recently achieved high efficiency of ~19.3 percent, well exceeding most thin-film and organic solar cells' efficiencies. The presence of lead, toxic material in these solar cells, therefore poses serious challenges to our health and the environment. 'Tin' is nontoxic and stands as a replacement to 'lead' for commercial purposes. in halide based Perovskites possess a potential for higher quantum efficiency because of their enhanced light absorption capability due to the wide-ranging absorption spectrum in the visible region with a comparatively lower band gap of 1.3 eV than lead-based Perovskites. In this work, we have modeled a tin-based perovskite simulation model with FTO Glass / ZnO / $CH_3NH_3SnI_3$ / Cu_2O / Pt. novel architecture and analyzed using the SCAPS-1D, which is well suited for studying photovoltaic architecture. Use this software method and we analyzed the thickness, fault density, and operating temperature of the model by simulating under various conditions. With the optimize the thickness to be (0.03 µm) corresponding best efficiency among another thickness of perovskites, and other layers, the defect density of absorber layer (10^{17} cm-3) the encouraging result of maximum power conversion efficiency(PCE) reached to 9.27%, the short-circuit current density(Jsc) is 46.569 mA/cm2, and fill factor(FF) is 31.17% and open-circuit voltage(Voc) is 0.637 V is calculated.

Properties of O(6)-U(5) transition symmetry for $^{122\text{-}124}$Cd isotopes in IBM

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Abstract.

The some properties, Energy levels, B(E2) values and potential energy surface, for even-even ^{122,124}Cd isotopes have been studied using the interacting boson model. The predicted levels (energies, spins and parities) and B(E2) values results were reasonably consistent with the experimental data. The contour plot of the potential energy surfaces shows all interest nuclei were deformed and have O(6)-U(5) transition symmetry.

Keyword: IBM-1; neutron-rich; transition; energy levels

Spectroscopic plasma diagnosis of Vanaduim pntoxide at a Variable of Operating Power and Pressure With Radio Frequency Magnetron Sputtering

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Abstract

In this paper, we examine the basic features of "magnetron spraying plasma" using the V2O5 target. Plasma magnetron spraying is generated using a "radio frequency (RF)" power supply and argon gas. The intensity of light scattering from atoms and radicals in plasma is measured using the "optical scattering spectrophotometer", and the peaks appearing in all patterns are in accordance with the standard lines of the NIST database and calculate the electron temperature and density to estimate plasma parameters. The properties of V2O5 spray plasma are studied under multiple discharge conditions at a "radio frequency" (RF) power of 75-150 watts and a gas pressure of (0.1, 0.08) mbar. It can be seen that with increasing staining power, the intensity of diffusion lines increases. We know that the when discharging too much pressure is 0.1 to 0.08 mbar intensity of the emission lines increases with increasing the sputtering power

Keywords: Plasma spectroscopy, V_2O_5, Electron Density, Electron Temperature, Magnetron Sputtering.

Radiation Hazards due to radon in the air of Buildings Surrounding Imam Hussain Holy Shrine in Karbala, Iraq

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Abstract

Introduction: In this work, radon measurements have been carried out in different Buildings Surrounding Imam Hussain Holy Shrine in Karbala, Iraq.

Materials and Methods: Radon concentrations were determined by using time-integrated passive radon dosimeters containing (CR-39) solid state nuclear track detectors.

Results: The radon concentration in the building has been found to vary from 23.958 to 88.233 Bqm^{-3} with an average 39.372 Bqm^{-3} this value is less than (200-300 Bqm^{-3}) recommended range (ICRP, 2009). The internal annual effective dose value ranged from (0.399) to (1.469 $mSvy^{-1}$) with an average value (0.655$mSvy^{-1}$) which is less than the lower limit of the recommended range (3-10 $mSvy^{-1}$) (ICRP, 1993).

Conclusion: The values of lung cancer cases per year per million person ranged between (7.181) to (26.445) with an average value (11.800) per million person which is lower than the recommended range (170- 230) per million person (ICRP, 1993). The positive relationship between the concentration of radon gas and lung cancer cases per year per million person (LCC) in indoor building samples in all locations studied. It can be said that all the results of this study are less than the internationally permitted limits and therefore do not pose a risk to the health of workers and visitors to the Imam Hussain Holy shrine.

Keywords: Radon, CR-39 nuclear track detector, Health Risk Assessment, Indoor air, annual effective dose.

Metal type Effect on Plasmonic Fiber Properties

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Abstract
In this study, the properties of plasmonic fiber have been studied, in which the core is one of the noble metals (Au, Ag, Cu, Al). The modes and the effective refractive index associated with each wavelength were derived using the COMSOL MULTIPHYSICS based on the Finite Element Method. The electrical permetivity was studied using the relationship Lorentz derode to determine the real part for the refractive index and the imaginary part responsible for the attenuation coefficient. Where a frequency range was chosen to hold negative values for the real part. The results show that when drawing the relationship between (ε_r) or (ε_i) a function of the wavelength that gold has the highest value and then silver, copper and then aluminum, but in the case of (n_r) or (n_i) we notice that aluminum has the highest elements.
(n_{eff}) has also drawn as a function of the wavelength, the four metals, and different of the core radius (a= 100, 200, 300, 400, 500) for the three modes ($LP_{01}, LP_{11}, LP_{21}$) and the metal used. It is observed that increasing the mode index increases the lobes where the mode (LP_{01}) is one spot and the mode (LP_{11}) is two spot and the mode (LP_{21}) is four spot,
where the power index increase is the increase in red and yellow color, and this applies to all modes. In other words, by controlling the radius of the core and wavelength, we can balance the ratio of power that propagation forward and backward. The refractive index (neff) has the highest value at small wavelengths and then begins to decrease with increasing wavelength, and has the highest value in the case of gold, then silver, then copper. Then aluminum, which is less than the rest of the elements.

Keywords: Nobel Metals, Plasmonic Fiber, Refractive Index, Permittivity.

Effect of laser fluencies on solar cell characterization of $(CdO)_{1-x}$:Sb_x/PSi thin films by laser induce plasma.

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Abstract: In this paper, Cadmium Oxide: Antimony has been deposited on porous silicon substrate using laser induces plasma technique. The solar cell parameters fill factor and efficiency; have been analyzed through changing of laser energy. The results shown that the change in electron mobility resulting from the change in laser energy leads to significant improvement in fill factor and efficiency. Moreover, there is slight improvement in the efficiency of CdO: Sb/Psi solar cell as a result of changing the thickness of CdO: Sb.

Keywords: Laser Induce Plasma, Cadmium Oxide, Doped Antimony, Porous Silicon, Solar Cell

Synthesis of ZnO and CdO thin film on PSi substrate using ElectroChemical Methodology for piezosensor

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Abstract*:* (PSi) substrates generated using an electrical and chemical engraving mechanism at current concentration (35) mA/cm^2 with varying engraving time (2 and 3) min, in which ZnO, CdO and 50 percent ZnO:50 percent CdO of chemical spray pyrolysis were examined using SEM and XRD methods.

Keywords: PSi, electro-chemical method, Zinc oxide, CdO, SEM, Piezosensor.

The Judd Ofelt Spectroscopic analysis for Ho^{3+} doped with SiO_2

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Abstract

Holmium ions Ho^{3+} Doped with Silicon dioxide was synthesis with help of wet chemical process. Techniques such as UV- Visible spectroscopy and fluorescence spectroscopy were used to investigate the spectroscopic properties of of Ho^{3+}:SiO_2 sample. The Judd-Ofelt theory is used to achieve of the spectroscopic properties to prepared sample and calculates the three Judd-Ofeltt of parameters; Ω_2, Ω_4 and Ω_6. From the obtained parameters, the A(J;J'), τ_{rad} and $\boldsymbol{\beta}_{J \to J'}$ are calculated. Depending on the suitable value of A(J;J'), τ_{rad} and $\boldsymbol{\beta}_{J \to J'}$ it could suggests to use Ho:SiO2 as Laser active medium.

Keywords: Sol- Gel; Spectroscopy; $S i O_2$; Judd-Ofelt

Design of Mechanical Multi-Sensor for Contaminated Water Filter Applications

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Abstract: Effect of addition (salts, soil and bacteria) on piezoelectric detecting a signal of a specific liquid like water has been inspected here in the project. Identifying signals (piezoelectric) categorized and accomplished by usage of transducer that conducts a mechanical signal in the direction of the water liquid cell, and then the receptor collects the weakened indications. The quartz cell (contains water solution) embedded between the two piezo crystals and piezo crystals with silver (Ag) nanowire thin film prepared using hydrothermal method. It is clear that the formation of the yield is rope-similar and close to be uniform in width (60 ± 10 nm) whereas the extent is in a moderately wide range (from 0.2 to 4 µm) with an average at 2.5µm. Four peaks can be recognized in XRD results, it is clear according to the ASTM cards that the film is polycrystalline at which (111), (200) and (220) silver (Ag) respectively. The range of functioning frequencies was (400 kHz - 40MHz), for all specimens, the measurement outcomes that involved reporting the first order resonance frequencies. The data presented shifting the resonance frequency to the higher order frequency for addititive cases (salts+soil+bacteria) of water.

Keyword: Salt water; Ag nanowire; Pizosensor; bacteria; Resonance Frequency, Damping Coefficient**.**

Simulation of Raman spontaneous scattering factor effect on Stoke Raman and passive Q-switching pulses characteristic

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Abstract:

The effect of Raman spontaneous scattering Factor (K_{sp}) on characteristics of passive Q-switching and Raman pulses of (Nd:YVO4, Cr+4:YAG and BaWO4) system has been simulated. A software computer program based in this study to solve the rate equations model using Runge- kutta - Fehalberg numerical method. The study shows that the increase in the value of K_{sp} leads to an increase photons density, energy, and, the power of passive Q-switching and Raman pulses. While small effect on pulses duration. The final value of the population inversion decreases with the increase of K_{sp} .

Keyword: Physics, Laser, High power pulses, Raman pulse

Effect of solvents on the morphology of TiO2 nanoparticles prepared by microwave method

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Abstract

In this study, titanium dioxide (TiO_2) was synthesized using microwave method as rapid, uncostly and effective method. In order to study the effect of the solvent on the morphology of the prepared samples, two different solvents were used. The first solvent was ethylene glycol (EG, 99.8%) and the other was deionized water (DIW), while titanium isopropoxideTi$[OCH(CH_3)_2]_4$ was used as TiO_2 precursor. A commercial microwave oven was used with a power of 750 W and 5 minutes was selected as a duration of time preparation. The prepared specimens were annealed at 400 °C for 1 h. Diverse techniques were used in this study, such as X-Ray diffraction (XRD), field emission scanning electron microscopy coupled with energy-dispersive X-ray spectroscopy (FESEM-EDX) and Fourier transforms infrared spectroscopy (FTIR) to study the structures and morphology of the prepared TiO_2. Surface area was measured using Brunaner EmmettTeller (BET) technique. The XRD results revealed that the prepared samples were a pure TiO_2 in anataseface.

Noticeably, FESEM results show that the prepared TiO_2 samples were nanorods-like shape with a length varied from 2 µm to 30 µm and a diameter varied from 500 nm to 6 µm when EG was used as a solvent. In contrast, spherical agglomerated nanoparticles with average diameters 20 nm were obtained when DIW was used as a solvent. The BET analysis revealed that the surface area of TiO_2 nanorods was 151.413 m^2/g, while it was 103.365 m^2/gfor TiO_2 nanoparticles.

Keywords:TiO_2;nanorods; microwave; surface area

Power Flux in Cylindrical Waveguide with Metamaterials

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Abstract—
Analytical and numerical analysis of electromagnetic wave propagation in cylindrical waveguides filled with isotropic metamaterial is presented. Emphasis is given to the characteristics of power flux in the waveguide. In the structure of the waveguide, The characteristics equation for the modes in this waveguide is obtained. The behavior of the dispersion curves and the energy flux are examined theoretically. The negative energy flux propagation through the cylindrical waveguide is confirmed.

Keywords-cylindrical waveguide; Dispersion relation; isotropic metamaterial;SNG material; power flux.

Enhancement of the Structural and Optical Properties of (PVA-PANI) Polymer Blend By Addition of CuI Nanoparticles

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Abstract
PVA:PANI/CuI thin film composites have been prepared by adding (CuI) particles to the mixture of the poly vinyl alcohol (PVA) and conductive polyaniline (PANI) with various concentrations (0, 2, 4, 6, and 8% wt) using casting method technique on a glass substrate at laboratory temperature. The prepared thin film samples have lightweight, low cost, and flexible. The morphological, structural, and optical properties of these composites were examined by using Fourier transform - infrared spectroscopy (FTIR), X-ray diffraction (XRD), and Atomic Force Microscopy (AFM).
The effects of CuI concentrations on the optical properties of the PVA:PANI thin films were studied in the region of wavelength (190-1100) nm. The results are presented the prepared thin films have high values of absorption in UV range. Increasing CuI nanoparticle concentrations lead to increases the absorbance of (PVA:PANI) blend. The optical coefficients rise while the energy gap and transmittance falls with increasing CuI nanoparticle concentrations.

Keywords: *poly vinyl alcohol, polyaniline, CuI nanoparticle, polymer blend*

Impact of Natural Plant on characterization of Nano Biomaterial for Blood Toxicology

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Abstract:
In this study, the effect of adding natural plants on the properties of nanomaterial's to treat blood poisoning caused by exposure to continuous doses of nuclear radiation has been studied. Nanomaterials were prepared in simple, inexpensive physical and chemical methods. The treatment results showed a high efficacy with a short period of time
Keywords: *Natural plant, Blood toxicology, Nano biomaterial.*

Synthesis and temperature Effect of ZnO nanoparticle seeding layer and nanorods

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Abstract:

Zinc oxide nanostructured with different seeding layer annealing temperature have been synthesized by drop casting technique on FTO coated glass substrate. The optimized seeding layer have employed to synthesis ZnO nanorods were growth aqueous solutions method of zinc nitrate and HML as precursors with different growth temperatures.

FESEM supported by EDS results showed significant information of ZnO topographic surface. X- Ray diffraction scan demonstrate a hexagonal wurtzite structure with c-axis orientation of the ZnO nanorods. Strong ultraviolet (UV) emission of ZnO nanorods has detected by UV visible measurement. The obtained results have analyzed optimize annealing temperature of ZnO seeding layer and suitable growth temperature of ZnO nanorods, with crystal hexagonal ZnO nanorods and homogenous distribution with $95^{o}C$ growth temperature

Key words: ZnO , nanostructure ,nanorods, seeding, sol-gel

Biological Papers

Contents

Effects of Age, Gender and Pregnancy on Blood Cholesterol and Triglycerides Levels in Nasirya City Inhabitants, Iraq

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Abstract: The first aim of the present study is to assess the influence of gender and age on blood levels of cholesterol and triglycerides among inhabitants of Nasirya City. The second aim is to monitor both parameters among pregnant and non-pregnant women in the city. Both aims are essential in evaluating the health risk of these vital blood parameters. The present investigation showed that, average cholesterol and triglyceride levels increased linearly with age being higher in old people than young persons. It showed also that levels of cholesterol in non pregnant women exceed those in pregnant women. It varied between 148 mg/dl in pregnant to 180 mg/dl in non pregnant women. Differences were significant according to LSD Test. Most of the pregnant women in Nasurya City are young (22-38 years old). This may be the reason for protection against high cholesterol by active estrogens. It appeared that female specimens had an average value of both parameters higher than males. Cholesterol level of 37 males averaged 169 mg/dl which is lower than that recorded in females (182 mg/dl), triglycerides elevated from low value of 182 mg/dl in males to 197 mg/dl in females. In both cases, differences were not significant according to LSD test. Young men are at a higher risk for developing high cholesterol than are young women. Estrogen levels in young women have a protective effect against high cholesterol.

***Keywords**: Cholestrol, Triglycerids, Age, Gend*

A Study of Anti-Fungal Activity for Some Antibiotics Against Aspergillus spp. and Candida spp. in Iraqi patients with Diabetes Mellitus

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Abstract

People with diabetes or with compromised immune system are at increased risk of fungal infection. Fungal nail infection is about four times more common in toenails than fingernails and can involve all or part of the nail including nail plate, nail bed and root of the nail. This study was aimed to investigate the anti-fungal activity of some antibiotics (Amphotericin B, Clotrimazole, Ketoconazole) against *Aspergillus spp.* and *Candida spp.* in Iraqi patients with DM. Fifty plates of these fungi were used in this study that isolated previously from toenails and fingernails of Iraqi Diabetic Patients   recruited at Central Public Health Lab. Results in this study illustrated that the majority of fungi showed high sensitivity against specified antibiotics.

Keywords: Aspergillus spp., Candida spp., Amphotericin B, Clotrimazole, Ketoconazole**.**

Thi-Qar Province in Iraq Confront Coronavirus Disease (COVID-19)

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Abstract:

Since its quick prevalence all over the world, no study has however established the effect of coronavirus disease (COVID-19) in Iraq. In this ponder, we would like to highlight Thi-Qar province circumstances to confront COVID-19. So far, the Thi-Qar procedures are not able to completely cover the outbreak of COVID-19. Hence, we are barely confronting this prevalent barely. So at that point, the predominance of this prevalent in Thi-Qar will have a disastrous impact on the citizens of this city. To control the COVID-19 prevalence in this province we must build field hospitals for infected patients with an adequate number of quarantine rooms, supply AL-Hussein Teaching Hospital in Thi-Qar Province with reverse transcriptase-polymerase chain reaction (RT-PCR) and provide approval of viral transport media (VTM) with a fiber swab with plastic shafts. Also, training of front-line hospital staff is of utmost importance especially in the safe dealing with patients, the collection of specimens, and most importantly is the expansion of the range of the field survey of areas of potential infection to detect inactive cases.

*Keywords***:** Coronavirus Disease (COVID-19), Thi-Qar province, VTM, and fiber swabs.

Effects of infection with Entamoeba histolytica on blood parameters in cancer patients (malignancy and leukaemia)

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**

Abstract:

Cancer and cancer therapy result in complications that reduce the ability of the immune system to resist infections. The present study was conducted in patients with malignant cancer and leukaemia from Basrah specialist children's hospital auditors of children infected with *E. histolytica.* Total white blood cell (WBC) count, haemoglobin (Hb) concentration, packed cell volume (PCV) and platelet (thrombocyte) count were examined; these parameters were shown to be lower in patients with cancer than in those infected with *E. histolytica* and healthy children. Patients with cancer had chronic or repeated infections with *E. histolytica*. Reduction in WBC count, Hb concentration, PCV and thrombocyte count in patients with cancer, particularly leukaemia, was a result of cancer and chemotherapy side effects that results in severe deficiencies in blood parameters of the treated patients with cancer.

Keywords: Cancer; Chemotherapy; Blood parameters ; Children; Infection.

VIRAL HEPATITIS IN DHI-QAR PROVINCE: DEMOGRAPHICS AND HEMATOLOGICAL CHARACTERISTICS OF PATIENTS

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Abstract

Hepatitis infection is the leading cause of hepatic failure and a global health problem; especially in developing regions. Infection with hepatitis causes disorders of liver function linked to the abnormality of many hematological markers. The current study aims to detect the effects of hepatitis viruses (HAV, HBV, and HCV) and hematological markers in patients, and the type and Prevalence of contamination with hepatitis in different age groups; In this case-control study; collected samples from 75 patients with hepatitis (25 women and 50 men) their ages range from 18 to 65 years and 20 healthy people (9 women and 11 men) with the age range from 17 to 63 years as a control group In this study the enzyme-linked immunosorbent assay (ELISA) was used to detect virus types. Present results have shown that the majority of patients are HBV-positive 29 (39%) followed by HCV-positive 27 (36%) and HAV-positive 19 (25%). Also, most patients with HAV, HBV, and HCV are males (63%, 66%, and 70 %, respectively). The current results revealed that the mean age and gender differences between patients and healthy individuals are not significant. Hematological analysis showed an increased level of WBC and decreased levels of PLT, Hb, and PCV in hepatitis infected patients. These results also showed that the majority of patients with hepatitis are males (67 %) between 18 years of age and 29 years of age (29 %).

Keywords: patients, HAV, HBV, HCV, hematological, Viral hepatitis, ELISA

Single Nucleotide Polymorphism of IL-10 gene rs3024491 in a Sample of Rheumatoid Arthritis Iraqi Patients

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Abstract
Cytokines play a prominent role in etiology and pathogenesis of rheumatoid arthritis (RA), and one of these cytokines is interleukin-10. The association between *IL10* gene single nucleotide polymorphism (SNP: rs**3024491**) and rheumatoid arthritis (RA) in a sample of Iraqi patients was investigated. Fifty-one RA patients (21 males and 30 females) were enrolled and their age range was 20 - 63 years (44.9 ± 1.5 years). In addition to patients, 45 apparently healthy control subjects were also enrolled in the study. They matched patients for ethnicity (Iraqis), gender (14 males and 31 females) and age (41.3 ± 1.3 years). Analysis of Hardy-Weinberg equilibrium (HWE) in RA patients and controls revealed that the *IL10* genotypes were consistent with the equilibrium, and no significant differences ($p > 0.05$) were observed between the observed and expected genotype frequencies. Inspecting *IL10* genotype and the allele *A* frequency was significantly decreased (30.4*vs*. 43.3; $p = 0.044$; OR = 0.57; 95% C.I.: 0.32 - 1.03; EF = 0.19).. In conclusion, the results are in favor of no association between *IL10* gene SNP (rs**3024491**) and RA in Iraqi population.

Prevalence and Mortality among woman's with Breast Cancer in Iraq

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Abstract:

Background: Breast cancer is the most common cancer in females in Iraq and the world continues to be one of the main causes of cancer-related death. The prevalence of breast cancer in females is rising. The mortality rate by breast cancer can be reduced by regular breast cancer screening program for early detection and prevention**.**

Methodology: A descriptive study was performed to the determine the prevalence and Mortality among women's with Breast Cancer **.**The study was carried out in Al Sadr medical city and Middle Euphrates Cancer Center on Al Najaf Al -Ashraf city during the period from January [11,] 2019 to July [12] 2019 .A Non Probability "purposive" sample of (413) patients with breast cancer were selected based on criteria of female only in sample study and 2017 and 2018 years only**.**

Results: Data were collected by patient's records to identify the prevalence and mortality**.** The Data was analysis through using mean, Standard Deviation, frequency, and percentage. The study findings that the highest age group of sample was ranging from (46 – 60) have 47.1%**.** Majority prevalence the patients related to side of breast cancer its right side, Most of the prevalence and mortality of breast cancer on 2017 more than 2018.

Conclusions: The study concluded that: according to our age group (46-60) years who admitted to hospitals, Majority of the study sample showed urban residential, married, illiterate and housewife**.** Demonstrated the most women who are admitted to hospitals are overweight. Majority prevalence the patients related to side of breast cancer its right side, Most of the prevalence and mortality of breast cancer on 2017 more than 2018.

Recommendations: Increased health awareness and early treatment have led to a reduction in prevalence and mortality. Therefore, we recommend focusing on raising community health awareness for prevention and early detection of disease, raising the level of preventive awareness of the community to avoid risk factors such as obesity. The development of health programs for early detection and prevention of the spread of breast cancer, especially in the urban, extensive study on the prevalence and mortality of breast cancer throughout the country**.**

Key Word: prevalence breast cancer, mortality breast cancer, breast cancer

EVALUATION OF THE EXECUTION OF PRECAUTIONARY MEASURES TO DIMINISH THE PREVALENCE OF COVID-19 PANDEMIC AT AL-NASIRIYA CITY SOUTHERN IRAQ

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Abstract

COVID-19 consider a great worldwide health problem effect all person at any age and from both sex that placing a major economic burden on public health systems. This A cross sectional study consist of 460 respondents conducted to identify the commitment extent of people to the standards of prevention measures against corona virus at Al-Nasiriya city at Thi-qar governorate. The study conducted by special questionnaire consist of three parts the first part contain demographic characteristics, second part , concern with implementation of personal preventive measure, third one was about Sterilization and disinfection of tools and surfaces. The study results reveal that majority of study sample who applied personal preventive measure at age group (21-30), highly statistical association was found between implementation of personal preventive measures and age at p-value (0.000) also in respect to gender table illustrate that female always applying these measures rather than male, there was significant association at p-value (0.016). From the current study, we conclude that there is a statistically significant relationship between the application of personal protection measures and gender, as women are more committed to implementing these measures than men.

Key words: COVID-19, Prevalence, Prevention, Pandemic, hand washing

The comparison between male and female of infection Cryptosporidium in Baghdad

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Abstract

The present study aimed to explore the Cryptosporidium in 90 patients (human stool) selected from a private laboratory in Baghdad /Iraq during the period of study in (2019), by using the modified acid-fast Ziehl–Neelsen (ZN) stain to identify the oocyst of parasite in all samples, evaluate the prevalence of the parasite between males and females and for evaluate the relationship of the parasite and age of patients in this study .

This study showed that the total number of infected patients is 40 from 90 taken samples.

The result of this study showed no significant differences (p<0.01) appeared between the males and females of the study, the number of infected patients is (17 females out of 40 and 23 males out of 50).

And there were significant differences (p<0.01) between the younger ages that was more affected than the older patients (33.33% and 6.66%) Respectively.

ORGANS PROTECTIVE EVALUATION OF ACHILLEA MELLIFOLIUM AGAINST METHOTREXATE DAMAGED ALBINO MALE MICE.

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Abstract
The objective of this study was to consider as an explorer for in vivo studies on the named *Achillea mellifolium*. *The present research was aimed to study the in vivo organ protective activity of ethanolic extract of Achillea melifoliumin* by production of some secondary metabolites *in methotrexate induced mice.* A number of pharmacological and biological activities including antidiabetic, antidiarrhoeal, cytoprotective, antimutagenic, antioxidant, antimalarial, Antiinflammatory activities have been reported for this plant. The phytochemical investigation of *Achillea melifoliumin* have revealed the presence of polyphenol, flavonol glycoside, alkaloid, saponins, sesquiterpenoids and essential oil. Different organs were used in this study such as testes spleen, liver, kidney for this experiment. Each organ response was recorded and Histopathological section decleared the ability of plant extract to counteract the organs damaged by methotrexate (MTX) drug. .These results clearly well-known the protective potency organ of *Achillea melifoliumin*, which may explanation for some of the medical claims ascribed to this plant.

Key words: *Achillea millefolium, testes ,liver, spleen, kidney ,medicinal plant.*

Addition of different level of zeolite powder on Japanese quail bird feed and its effects on carcass parameters

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Abstract

Study was carried out at the poultry farm of the animal resource Department - Collage of Agriculture - Tikrit University for the period from 14\11\2018 to 12\2\2019 and the main aim of this study was to improve importance of addition of different levels of zeolite on Japanese quail bird feed and its effect on the primary and secondary carcass parts. And in this study a 240 birds were used and these were divided into four treatments with three replicates for each treatment and each replicates contained 20 birds with percent of one male and three female. And the birds feed with 20% percentage of protein and 2800 kilo calorie of energy.

The treatments were divided as following:

First treatment (T1) control treatment without addition of zeolite

Second treatment (T2) second treatment addition of 2g \kg feed of zeolite powder

Third treatment (T3) third treatment addition of 3g\kg feed of zeolite powder

Fourth treatment (T4) fourth treatment addition of 4g\kg feed of zeolite powder

The results showed that addition of zeolite have significant effect ($p<0.05$) on live body weight, carcass weight and main carcass parts (chest, thigh, back, wings and neck) at the treatment with addition of 3g of zeolite powder in compare with other study treatments.

Keywords: zeolite powder, carcass parts, Japanese quail bird.

Determination of virulence   factor activity of pathogenic candida collected from   variety specimen source .

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Aim of study : The study was done to determination of virulence factor was produced by candida spp.

Methods: One handred sample was collected from deferent patient in hospital from july 2108 tell June 2019 .there were used different method to identification and isolation of candida spp.

Result :   The study showed that *C.albicans* was isolated from   (80%) samples   and   Non *albicans Candida* (NAC),   were isolated   from   (20%) diffrent   specimen The phospholipase positive activity was found in 40   sample   with   high   percentage (80%).while proteinase   enzyme   was   appear   in   38   sample   with   percentage (76%) Candida   isolates. Lipase activity was seen in 32(64%) samp   All isolates was able to produced   *β*-type of haemolysis

Conclusions   : Both *C.albicans* and NAC spp. produced extracellular hydrolytic enzymes.

Key words: virulence factors ,candida spp. Pathology

The Effect Of TNF-α , IL-8 And Peripheral Blood Lymphocytes Immune Alteration Phenotype In Pathogenesis Of Hepatitis C Virus Patients.

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Abstract

project attempts to estimate the manifestation of stimulated indicators on pBL ,as the manifestation of CD45 & CD74 in patients infected with HCV assessment of TNF-α and IL-8 serum ranks in patients with HCV , associate the consequences of pBL –stimulation indicators appearance and serological valuation of TNF-α &IL-8 using multiple infection phases.

A total of (84) seropositive patients for HCV were screened for this study .Patients attended general lab. of Al-Muthanna province , because of abdominal pain , jaundice and loss of appetite and other liver complaint, any serum samples expressed positive for anti-HCV antibodies directly choosed to show level of TNF-α & IL-8 in serum of patient and show expression of CD45 and CD74 in pBL in HCV patients. Results showed that serum samples were analyzed for IL-8 & TNF-α by ELISA , showed highly significant increases (p<0.05) in serum level of HCV patients as compared with healthy control groups , acute HCV revealed high as well as , increases in serum level of TNF-α significantly(p<0.05) ,while chronic liver disease patients express high increase in serum level of IL-8 significantly(p<0.05).Activated markers study revealed high expression of CD74 & CD45 in HCV patients as compared with healthy normal groups ,where acute HCV patients were showed significantly(p<0.05) high expression in CD74 & CD45 compared with other HCV patients .

Preparation, diagnosis and study of the inhibitory effect of copper nanoparticles before and after Erythromycin loading on Pseudomonas aeruginosa

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Abstract : Pseudomonas aeruginosa is one of the opportunistic nurses, which possesses many virulence factors which makes it a high ability to resist antibiotics multidrug-resistant (MDR).leading to make Antimicrobial resistance is one of the main threats to human health because it leads to increased infection rates and mortality. The present study aimed to evaluate the mechanism of inhibitory effect of the free CuO nanocomposite and its synergistic effect with the anti-bacterial erythromycin ER after it was loaded on the CuO / ER nanoparticle on Pseudomonas aeruginosa isolated from Al-Hindiya General Hospital. The CuO nanoparticles were manufactured by using precipitation method .Diagnosis free CUO and nanoparticles after they were loaded onto nanocomposites by using the AFM atomic force microscope. the inhibition zone diameter measured by Disc Diffusion method the results was indicated the highly synergistic effect on bacteria , while the free nanoparticles are less effective, whereas the antibiotic alone gave the lowest inhibition diameter (21.25 ±0.854, 11.75 ±0.750, 8.50   ±1.040) respectively, moreover this study investigated that The release of the antibiotic ER from the CuO / ER that the second pseudo order   model is more applicable to the interpretation of the behavior of ER release from CuO / ER (K = 2.60min-1 , r2 = 0.997) which indicates that the forces controlling the release of ER are flexible without dissociation and being affected by the metabolism, and the percentage of ER release was significant due to the intensity of the surface ion exchange between   CuO / ER and the anion (CO3)-2 coming from CaCO, which makes the ER release rate to reach more than 98% in the medium of sodium carbonate at a concentration of 0.05 M within 250 minutes of the start time of the reaction.

Key words: Free Copper Oxide Nanoparticals , *P. aeruginosa*, Erythromycin, Synergistic effect.

The response of hypoalbuminemia, hypocalcemia and hypercholesterolemia to regular treatment in a group of pediatric patients with nephrotic syndrome

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Abstract
Background: Nephrotic syndrome represents a relatively common renal disorder in pediatric age group. It is commonly presented with a triad of edema, proteinuria and hypoalbuminemia. It has many histopathological types, with the minimal change disease being the most common type in children. This study aimed to evaluate the serum level of albumin, ionized calcium and cholesterol in patients already on treatment.
methods: 58 pediatric patients with nephrotic syndrome have been enrolled in the current study. All participants were investigated for serum albumin, ionized calcium and cholesterol, in addition to the basic laboratory tests. The results were statistically compared to the reference range using GraphPad prism software. Statistical correlation between the studied parameters has been evaluated as well.
Results: Mean serum albumin was significantly low (22.4 g/L ± 9.4), with 89% of participants had hypoalbuminemia. Mean serum cholesterol was significantly high (8.4 mmol/L ± 2.99), with 87% of participants had hypercholesterolemia, which has shown a strong negative correlation with serum albumin. Ionized calcium was normal in 97% of participants, where its mean was 1.13 mmol/L ± 0.2.
Conclusion: Correction of hypoalbuminemia and hypercholesterolemia seems to be much more difficult in pediatric patients with nephrotic syndrome compared to hypocalcemia.

Keywords: nephrotic syndrome, hypercholesterolemia, hypocalcemia, hypoalbuminemia, pediatric

Fungal Diversity of Winter Wheat Parts, Seed and Field Soil in Iraq, Basra Province.

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Abstract

This study was conducted to survey the fungal microflora in winter wheat (*Triticum aestivum* L.), ear, stem, root, seed and field soil in 17 field distributed on Basra province, Iraq. The mycoflora of plant parts, seeds and soil were determined morphologically and molecularly. In total 46 genera with 66 species of different fungal groups were found. The prevalent fungal group on all examined sources was the anamophic Ascomycota (85.34%), followed by Zygomycota (5.46%). Telemorphic Ascomycota was only at (3.64%) and Basidiomycota was in less than (1%). *Aspergillus*, *Penicillium*, and *Fusarium* were the dominant genera in soil and rhizosphere region. The same genera were found in seed but *Alternaria* was instead of *Fusarium*. The fungal diversity in plant parts was different, as *Alternaria*, *Fusarium*, *Helminthosporium*, *Cladosporium*, *Penicillium* and *Aspergillus* genera were more occurrence. The highest total fungal population was observed in rhizosphere region and soil, and the lowest was in wheat head. The occurrence of collective fungal community was almost identical in wheat seed, root and stem.

Keywords: anamorph, morphological identification, molecular, rhizosphere, telemorph.

ASSESSMENT OF THE PHYTIN CONTENT IN THE FRUIT OF FIVE SPECIES OF JUGLANS WHEN INTRODUCED IN CENTRAL RUSSIAN UPLAND

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Abstract. The phytin (myo-inositol-1,2,3,4,5,6-hexacystichydrophosphoric acid) content was studied in the endosperm of five species of *Juglans* grown in the Central Russian Upland conditions: 1) Persian walnut (*Juglans regia* L.); 2) Manchurian walnut (*Juglans mandshurica* Maxim); 3) heartnut (*Juglans cordiformis* Maxim); 4) grey walnut (*Juglans cinerea* L.); 5) black walnut (*Juglans nigra* L). The walnut is shown to have the highest phytin content (31.90±0.67 mg/g wet weight) and a low coefficient of variation (Cv=4.23%). Based on the research, we can conclude that walnut is well adapted to the conditions of the Central Russian Upland and is recommended for the creation of fruit plantations by seed.

Seeking the Mutual Goal: Investigating Attitude toward Collaboration between Nurses and Physicians

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Abstract

Purpose of study: Inter-professional collaboration is critical for patient care outcomes and instituting proficient communication between nurses and physicians is unescapable. So, this study aims to (i) Investigate the attitude of physicians and nurses toward inter-professional collaboration and (ii) Identify the relationship between certain demographic characteristics and the overall attitude.

Design of study: Cross-sectional descriptive design was adopted in this study.

Methods: The researcher used the Arabic version of the Jefferson Scale of Attitude toward Physician-Nurse Collaboration (JSAPNC) as a tool to achieve the purpose of the study. 236 physician and nurse were participated in the study. All nurses and physicians who have one year of experience or more were qualified to be comprised in the sample.

Findings: Results show that the nurses have more positive attitude toward physician-Nurse collaboration were he total mean score for nurses was 3.10 in comparison to 3.06 for physicians. Also, there was a statistically significant relationship between overall attitude while no relationship appeared with years of experience.

Conclusions: according to the study findings, nurses have more willingness to collaborate with physician despite the literature proven effect of hierarchical model of patient care which is followed in Iraq.

Keywords: Physician-Nurse Collaboration, Jefferson Scale, Inter-professional partnership

Effects of statins on platelet count in hyperlipidemic patients

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Abstract
Statins are the strongest available lipid-lowering therapy and prescribed in nearly all patients with cardiovascular diseases. It play a great role in reducing morbidity and mortality associated with stroke diseases. Recently, it has been confirmed that the beneficial effects is far more than lipid-lowering actions; and pleiotropic effects have a complimentary role in cardiac diseases. Thrombocytopenia and platelet dysregulation could participate in reducing the cardiac disease fatality. This study aimed to investigate statin action on platelet following short-term use of lipophilic statin (atorvastatin) and hydrophilic one (rosuvastatin). Blood samples were collected from newly diagnosed patients and platelet counts are manually performed. Patients were assigned randomly into either atorvastatin or rosuvastatin use and blood sample collected before and after 6 weeks following therapy. The results revealed that platelet counts, bleeding or clotting time were non-significantly changed in both treated groups. The study concluded that neither lipophilic statin, nor hydrophilic ones, induced any changes with measured parameters; however, the limitation of our study include small sample size and lack of measuring of secretome parameters (fibrinogen, serotonin, and Ristocetin)
Keywords: bleeding, clotting , atorvastatin, rosuvastatin, statins, platelet.

Protective effect of red cabbage and garlic extracts against Fumonisin B1 induced hepatotoxicity in male mice

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Abstract- Red cabbage and garlic extracts have protective effect against liver damage induced by fumonisin B1 (FB1) in male mice was studied. Randomly sixty mice have been divided in to six groups. Group one are the healthy mice, Group two are mice received oral dose of only FB-1 (100 µg/kg.b.w) once on daily for 1 month, Group three: mice received with red cabbage extract (500 mg/kg.bw) plus FB1, Group four: mice receiving just red cabbage extracts, Group five: mice receiving garlic extract (500mg/kg.bw) plus FB1, group 6: mice received only garlic extract. After finished the experiment, samples of blood were used for biochemical examination. The results indicated that group (2) mice treated with Fumonisin B1 had significant increased (p less than 0.05) regarding the liver enzymes namely LDH, ALP, AST, GGT, as well as ALT and also in this work there has been significant increase (p less than 0.05) in lipid profile, T.ch, TG, HDL, VLDL but significantly decrease in reduction of LDL. Oral administration related to red cabbage as well as the garlic extracts produced significantly reducing the level related to serum of the VLDL, TG, LDH, ALP, AST, ALP, GGT, T.ch, ALT as well as HDL and cause increase significant in LDL.

Keywords— Red cabbage, Garlic, Fumonisin B1, Liver function.

Activity of a novel Selena-diazole derivative compound on primary neuron cells isolation from cortex and hippocampus of 18th day aged fetus of pregnant Wister rat

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Abstract

Seleno-cysteine amino acid is originated in the active site of all selenium containing enzymes such as glutathione peroxidase. Several selenoproteins in the brain, but their roles were remained not well documented. The aim of the study is to investigate the effect of a novel selena-diazole derivative i.e. 4, $\overline{4}$ - (4, 5, 6, 7- Tetrahydro- [1, 2, 3-] selenadiazolo [4, 5e] pyridine - 4, 6 - diyl) bis (benzene-1, 3-diol) (SeD) on viability of cortical neurons and primary hippocampus cells isolated from prenatal rat pulps at 18th days. Fetal brains were removed and placed in an ice chilled Hibernated E. Hippocampi and cortices were separated. Papain 0.05% added for 10 min at 37º C; then trituration by fire polished-glass pipettes were done. Culture dishes with diameter 60 mm or 24-well plates were coated by Poly D Lysine on a density $5*10^4$/dish. Neurons were cultured on neuro-basal medium complemented with B27 and incubated in a humidified Co_2 5% atmosphere incubator at 37º C. SeD in different concentration were added, viability percentage were estimated at zero time, after 1hr, 2hr, 3hr. The results illustrated that a significant decreased in viability in a dose dependent and a time dependent manner in comparison with control and solvent groups. Despite the statistically significant level of cell viability, the levels remain high compared to other selenidiazole derivatives, also it showed the most reduction percentage after incubation for 3 hour of all treated groups, also, high significant reduction observed in 400 and 500 µg/ml treated groups. It can be concluded that SeD compound has a dose and time dependent reduce in cell viability; but still more preserve effects on neuron cells than control groups.

Key wards: Selenadiazole, primary neuron cells, viability, trypan blue, Acridine Orang Stain.

Histopathological study of Cinnamomum zeylanicum equeous extract and   Cladosporium sp. Extract on different albino male mice organs

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Abstract

The objective of this study was to considered as an explorer for *In vivo* studies on the production of some secondary metabolites from local medical plants named *Cinnamomum zeylanicum* to study their effect on mice organs that treated with *Cladosporium sp.* extract (*In vivo*). Preparation of water extract of *Cinnamomum zeylanicum.* different doses were prepared (20,40,60,80%) of plant which (9) male mice were used and divided into three control group and dosed with distilled water mice were administrated with first dose 1ml/kg of *Cladosporium* extract for two weeks and mice were administrated *Cladosporium* with 80% of the aqueous extract of *Cinnamomum zeylanicum* at a dose of 1 ml / kg daily for two weeks. Mice treated with *Cladosporium sp.* fungal filtrate caused vascular congestion in the tissues of the liver resulting in cell bleeding, in addition to many changes in chromotin in and nuclei sized increased while the results indicate the ability of the mixture between fungal filtrate and *Cinnamomum* to counteract these adverse effect in mice and return its appearance looks like normal also the kidney of animals treated with *Cladosporium* fungal filtrate caused retention of congested glomeruli with a large pool of fluids while the result of interaction caused inhibition in radial growth of the fungus and reduced its effectiveness on kidney function and the synthetic form of the tissue.

The relationship between the prolactin level and kidney function in women with hyperprolactinemia

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Abstract
This study aimed to find out some of the biochemical variables related to kidney function that occur in the blood serum in people who suffer from high levels of milk hormone prolactin. The study included (30 samples) infected with the disease and the age ranged between (28 - 40) years, while the healthy group included (15 Sample). The study included measuring the hormone concentrations of milk, urea and albumin in addition to creatinine. The results of the study showed a significant increase in hormone concentrations as well as urea concentration and albumin concentration in the patients group at a significant level ($P \leq 0.05$). The results of the study also showed a significant increase in creatinine concentration in the patients group at a significant level ($P \leq 0.01$).
Key words: prolactin hormone, kidney function, urea, creatinine, albumin.

Association study of VNTR Polymorphism of Dopamine Transporter 1 (dat1) Gene **in Violent Criminal Behavior in a sample of Iraqi prisoners**

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Abstract:

Dopamine Transporter1 Gene *(dat1)* Code for the production of dopamine transporter 1protein (DAT) that is implicated in the reuptake of dopamine. DAT is considered the best mechanism for terminating dopamine action and regulation the neurotransmission because it has high dopamine affinity. Termination of dopamine signaling is an important to process for keeping a suitable dopaminergic level. DAT is mainly expressed in the striatum and to a much lesser extent in other brain regions like the prefrontal cortex (PFC). The objective of this study was to determine the association between the risk *dat1*- VNTR genotype 9/9 and risk allele 9R frequencies with violent criminal behaviour in Iraqi prisoners.

In this study blood samples were obtained from 200 prisoners (cases groups), those who have been convicted of terrorism (150 samples), murder (30 samples) and drug trading (20 samples). These cases were selected from Al-Hila Prison Reformist Central for Men and Women / Babylon city, and from the position and deporting division /Karbala, These samples were included of 160 male and 40 female. Additionally, the control cases about 100 blood samples were obtained from 54 male and 46 female. DNA was extracted and the mentioned polymorphism variable number tandem repeat (VNTR) was genotyped by PCR.

Results: The *dat1* VNTR polymorphism was analyzed in case and control groups .The results demonstrated that there was non- significant difference in risk 9/9 genotype frequency (p= 1.00;OR= 1.00 ; 95% CI= 0.46-2.19) and 9R allele frequency between the study groups(p=0.69;OR= 1.08 ; 95% CI= 0.74-1.58).

Conclusion: The *dat1*risk genotype 9/9 and the risk allele 9R were a significantly non-associated with violent criminal behavior in Iraqi prisoners and The DNA sequencing result of *dat1* polymorphic region showed novel unit of repeats composed from 41bp given the symbol(J) and deposited to the NCBI and published in the data base under the accession number : **KY471644**

Keywords: Dopamine transporter1 protein DAT 1, *dat1gene* VNTR, genotype, violent criminal behavior.

Aspects of lipid profile and cardiac markers in rheumatoid arthritis patients

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Abstract:

Rheumatiod arthritis (AR) is one of the multiple chronic diseases resulting in many complications such as cardiovascular disease (CVD). Any change in the lipid profiles and myocardial markers indicates cardiovascular disease risk so this study is designed to monitor the pattern of lipid profiles and myocardial markers in RA patients. Blood samples were collected from 70 Iraqi patients newly diagnostic with rheumatoid arthritis (male and female) and 30 healthy served as control. These individuals were aged 35-65 years. The serum samples were obtain to determine myocardial markers; included troponin, creatinine kinase (CK), lactate dehydrogenase (LDH), and glutamic oxaloacetic transaminase GOT; and lipid profiles; such as cholestrol, triglycirate, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and very low-density lipoprotein (VLDL); using a kit from Roch (Germany), measured automatically with Minividas, Biomerieux (France). There are no differences between levels of all lipid profiles and myocardial markers in RA patients comparing with healthy group however they were within normal values. There were also only significantly positive correlations between cholesterol and triglyceride with age. Interestingly, the cholesterol/HDL ratio increased significantly in RA patients comparing with healthy, so it could conclude that the risk of CVD could be increase also among patients with newly diagnostic of RA. Moreover, the gander, the age at the disease onset, severity markers of disease, and TC / HDL ratio should be probably included in a model to predict the risk of cardiovascular disease for RA.

Key words: cardiovascular disease risk, myocardial markers, lipid profile, rheumatoid arthritis disease, TC/HDL ratio

Seroprevalence and Risk factors of Taxoplasma gondii among children in Al-Qadisiyah Province – Iraq.

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Abstract:

 Background: Toxoplasmosis is a disease associated with the nature of the population, domestic quality and general health culture. *Toxoplasma gondii* causes many healthy and psychological problems with the possibility of transmission from the mother to her foetus. The primary objective of this study is to establish a database of infection rates among the governorate's children, with the absence of a database of the parasite prevalence rate among children.

Materials and method: Four hundred sixty-three serum samples were collected during the period from 6 Jan. 2019 to 12 Dec. 2019, all of which were examined by ELISA test to detect immunoglobulin IgM and IgG. All results were analyzed by SPSS 20.

 Results: The current study referred to high prevalence rates of *T. gondii* (23.3%), where the ratios of IgM and IgG were (4.1% and 17.9%) respectively. Compared with the present rates of immunoglobulin with gender, age, environment and animal contact.

Conclusion: Our current study registered high prevalence rates among children in Al-Qadisiyah governorate, this result represents a database of researchers and workers of health. It's the first study concerning the prevalence of toxoplasmosis in children in Al-Qadisiyah Province.

keyWords: Toxoplasma gondii; children; Seroprevalance; IgM; IgG

Study of Serum Level of Zonulin Protein and Interleukin 15 in Patients with celiac disease .

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ABSTRACT
Objective: The goal of the study is to measure the serum level of Zonulin protein and Interleukin-15 in celiac disease's patients as they contribute to the pathogenesis of celiac disease.
Methods: A retrospective case control study conducted in Karbala province included 226 subjects (fulfilled all inclusion and exclusion criteria) intended endocrine centers in Imam Hussein medical city, Pediatric teaching hospital and Al-Hindiya general hospital from September 2018 till March 2019. Ethically all consent had been taken . (zonulin and IL15) measure in the serum of subject inaddition to {tTG (IgA, IgG), DGP (IgA, IgG)} by ELISA technique.
Results: The high serum zonulin levels two third of the patients, serum level of IL15 was normal in majority of patients
Conclusion:High inadequate adherence to gluten free diet lead to elevation of serum zonulin , no systemic effect of IL15
Key Words: Celiac disease, tTG (IgA) antibodies, intestinal permeability, gluten-free diet, zonulin protein, IL15.

Studying Effect Of Using Drugs of (Clomiphene citrate, Bromocriptine)on physiological & biochemical Parameters In the women have hormone disorder.

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Abstract
This study included (100) samples of women used drugs Chlomephine Citrate & Bromocriptine (women have hormone disorder) in (Dijla Hospital) (20) blood samples pulled from healthy women as Control sample. The samples were divided into three groups; the first group: - (40) women who have primary infertility and treatment , Chlomephine Citrate & Bromocriptine. the second group: - (40)women who have Secondary infertility and treatment Chlomephine Citrate & Bromocriptine.. The third group was the healthy women(control). The results of the study indicated a significant decrease in the Concentration of the(Human anti-mullerian Hormone , Inhibin B Hormone , Prolactin , Estradiol , Progesterone Hormone)at level ($p < 0.001$) in the women who have primary and Secondary infertility and treatment , Chlomephine Citrate & Bromocriptine when compared to the healthy group , While the results showed decrease in the concentration level of Cholesterol, Triglyceride, HDL in the women who have primary and Secondary infertility at level ($p < 0.005$) when compared to the healthy group.
aim of this study Effect the Drugs of (Clomiphene citrate, Bromocriptine)on some hormones and lipid level in the women who have primary and Secondary infertility
conclusion in this study there are significant decrease in the AMH, INH-B , PRL, Estradiol, Progesterone Hormone in the women who have primary and Secondary infertility and treatment , Chlomephine Citrate & Bromocriptine when compared to the healthy group and While there is significant decrease in the concentration level of(Cholesterol, Triglyceride, HDL)in the women who have primary and Secondary infertility when compared to the healthy group .
Keys word: Clomiphene citrate, Bromocriptine, Hormones disorder.

The Correlation of Histopathological Findings with Ultrastructural Changes in Hepatocytes after Yangonin "Ya"-Intoxicated Rats Alone and In Combination with EtOH: Sub-Acute & Sub-Chronic Study.

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Abstract

Yangonin "Ya" has been used for centuries as a herbal supplement, for its mood-altering properties. It has been used as a recreation agent, for relaxation, as well as for pain relief. However, hepatotoxicity is a widespread problem associated with medicines in general. Most herbal supplements are metabolized by the liver, and thus the liver represents the target organ. At present, Yangonin toxicity appears to be "idiosyncratic". Therefore, a study was designed in order to investigate the organelle-based changes in hepatocytes, after treatment with Yangonin alone and in combination with EtOH. Thirty rats were divided into five groups comprising of six animals each. The groups comprised of the control groups {(NCx) & (PCx)}, Yangonin (Ya) group, ethanol (EtOH) group, and the combination of (Ya) and ethanol (EtOH+Ya) group. The experiment was conducted over a period of 14 weeks, as a sub-chronic study. At the end of the 14th week, mitochondria, peroxisome, rough and smooth endoplasmic reticulum, and nuclei of hepatocytes, were evaluated using a scoring system. The results were compared with histopathological findings, as well. Treatment with Ya significantly induced hepatotoxic scores as compared to the control groups. Organelle injury scores increased significantly with Ya treatment, while rats that received "EtOH+Ya" showed the severest lesions of liver scores such as, severe hepatocellular degeneration, necrosis, and hypertrophy. Ultrastructural and histopathological scores in both groups were in very strong correlation ($r = 0.928$ for EtOH, $r = 0.921$ for Ya alone and $r = 0.903$ for Ya plus EtOH group). In conclusion, ethanol enhanced the sedative and hypnotic activity of Ya, and markedly increased toxicity. Findings based on TEM examination of organelles, supported the histological results as well as tissue lesions/injuries in hepatocytes, a result of hepatotoxin-induced hepatopathy.

Key words: Hepatopathy, Yangonin, alcohol, ultrastructure, sER, mitochondria.

Pathological and Physiological changes of Hesperidin against Gentamicin induced Renal damage in Rats

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Abstract

This research was led to find out renal protective activity of hesperidin (HES) 100mg/kg body weight (B.W) against Gentamicin (GNT) 100 mg/kg induced nephrotoxicity in rats . GNT GNT is utilized for the treatment of infected with Gram-negative bacteria. However, GNT administration is limited because of nephrotoxicity. Twenty male rats were classified equally into four groups: group (1) the control was given (1 ml/kg Saline orally) , group (2) was given GNT (100 mg/kg) , intraperitoneally (i/p)) ,while group (3) was given HES (100 mg//kg) orally for (14) consecutive days and group (4) GNT (i/p)) plus HES. for (14) consecutive days. All the rats had been sacrificed at the (15) day of the experimente, after that the the kidney samples and blood had been collected. The nephrotoxicity induced by gentamycin was proved by a significant ($p < 0.01$) drop in the body weight ,and a significant ($p < 0.01$)elevation of Serum creatinine (CR) , Blood urea nitrogen (BUN) , Urea (UR) , Malonaldehyde enzyme (MAD) and histopathological changes in group 2. Protective effects to renal toxicity and oxidative damage produced by GNT($P < 0.01$) through improving in body weight and decreasing CR , BUN , UR , MAD and improving tissue morphology in HES (100 mg//kg) (group 3,4). These results assure that HES (100 mg//kg) antioxidant effects can protect GNT-induced nephrotoxicity in rats.

Key words: Hesperidin , Gentamicin , Anti-oxidant , Rats.

Biopreparation for antimicrobial material from mixture of nano silver and olive leaves extract

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Abstract:

Silver nanoparticles were synthesized using different aqueous concentrations of silver nitrate (0.5,1 ,2, 3) with olive leaf extract as reductive factor. The reaction showed a strong change in color from yellow to dark brown. Antimicrobial activity against pathogenic bacteria like *Staph aureus* , *E. coli* was studied . Spectral properties were studied by using UV- visible spectrophotometer, all concentrations shown peaks at (435)nm .The nanosilver particles tested by Dynamic light scattering (DLS) so the size particles were about (80-126)nm , zeta potential values were (-17 - -23)m V .Biological silver nanoparticles gained interest in recent past owing to its simple preparation , low cost ,ecofriendly and their products more stability .

Key words: Olive leaf, Silver nanoparticles, Biosynthesis

Aspirin Therapy & Mid-luteal Phase Doppler Study in Iraqi Patients with Recurrent Pregnancy Loss

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Abstract:

Objective: to assess the effect of Aspirin on Doppler indices in a patient with recurrent pregnancy loss.

Materials and Methods: This prospective case-control interventional study was conducted in Al-Yarmouk teaching hospital in the department of obstetrics & gynecology Baghdad - Iraq from the 1st of January 2019 to the 1st of January 2020. The study involved a hundred women, fifty of them had a history of recurrent pregnancy loss (study group) along with fifty fertile women who at least had one live child (control group) all women were subjected to trans vaginal Doppler study at mid-luteal phase Pulsatility index PI, Resistance index RI were recorded, the study group received aspirin 75 mg for 3 months after which another Doppler study was made & the new readings were taken.

Result: The study group showed a significant increase in PI compared to control (p-value 0.044).A higher endometrial thickness ET (p-value0.002) & progesterone level(p-value 0.002)were observed in the control group, after adding aspirin 75mg for 3 months the Mean PI and RI significantly reduced in the study group (20%, and 18.2% reduction for PI and RI), while ET increased by 8.5%.

Conclusion: the observed changes in doppler parameters indicate improvement in the blood flow to the endometrium, promising effect which may be of value in managing those patients to improve their fertility potential & live birth prospective.

Keywords: Recurrent Pregnancy Loss, uterine artery Doppler, mid-luteal phase, Aspirin.

Histopathological study on Aborted Women with Toxoplasmosis

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Abstract

This study was performed to evaluated some histological aspects in (20) aborted women in the first trimester of pregnancy and infected with *Toxoplasma gondii* and (6) normal birth as a control group, who were attended in Medicine city hospital and Al-Ramadi Hospital from October, 2016 till end of January, 2017. Fifty g of placental tissue samples were collected from aborted women and control group with age ranged from (15-45) years. This study focused on the evaluation of histological changed of infected aborted women placenta by *T. gondii* compared with control. The result indicates various histopathological changes, where infected placenta with Toxoplasmosis showed necrosis, lymphocyte infiltrations, hydropic degeneration, fibrinoid deposition, vacuolation, hemorrhage, and present the parasitic stage comparded with healthy placenta tissues which shown the natural connective tissue**.**

Key words: Toxoplasmosis, Histopathological, *T. gondii*, Placenta, Women.

Effect Study of crude extracted from Coriandrum sativum on growth of Leishmania tropica promastigotes in in vitro

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Abstract:
analyzing of the basic oil that utilized in this examination showed that it is components to a great extent of monoterpenes, involve of β-caryophyllene (3.1%), octyl acetate (5.4%), p-cymene (3.3%), β-pinene (3.5%), sabinene (4.5%), limonene (9.4%), α-thujene (15.7%) and α-pinene (41.2%).
Coriander basic oil indicated action against *Leishmania tropica* promastigotes in in vitro. We used *Coriandrum* (*Coriandrum sativum*) leaves extract preparation on *L. tropica.* 0.1 ml of fluid phase was added to 10 ml of   medium 0.1 ml of inoculums of *L. tropica promastigotes* are taken from stock culture after the logarithms stage, that was the underlying culture which contain for 229 parasites, these parasites was brooded at 26 C^o for 4 days, and afterward tallied it via haemocytometer.   We take parameters on 24, 48, 72and 96 hours. In this study we found significant effect of concentration *Coriandrum* extract and time in the number of on numbers of *L. tropica* promastigotes. But don not found significant effect of concentration *Coriandrum* extract and time in the number of on generation numbers of *L. tropica* promastigotes. Between treatment do not found significant effect of concentration *Coriandrum* extract in the number of on generation time of *L. tropica*, but found significant effect of time on the number of generations of *L. tropica.*

Keywords: *Lieshmania tropica*, *Coriandrum sativum*, Coriandrum, RPMI 1640.

Comparing the Levels of Some Trace Elements with Liver Enzymes in Chronic Renal Failure Patients with Viral Hepatitis B and or C.

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Abstract: The object of this work was to assess the association amongst copper, zinc and iron in contrast with liver enzymes (ALT, AST and ALP) level in chronic renal failure patients with hepatitis B or C. Serum samples were obtained from 90 patients with chronic renal failure (CRF) submission to hemodialysis (HD) at the hemodialysis unit in AL kindy hospital, Baghdad, Iraq in 2019. The ninety patients who enrolled in this study were; 30 patients with hepatitis B virus, 30 patients with hepatitis C infection and 30 patients devoid of hepatitis virus. The concentration of zinc, copper and iron were resolute by means of atomic absorption spectrophotometer (AAS), liver enzymes determined with an autoanalyzer system. A significant correlation was found between means of Cu in CRF patients with hepatitis C and AST in CRF patients without hepatitis with $p\_$ value < 0.05 and Cu with AST in CRF with hepatitis B. Also a significant correlation was found between means of Zn and AST in both groups of hepatitis patients with chronic renal failure, between Zn and ALP in chronic renal failure patients without hepatitis, $p\_$ value < 0.05, According to Zn means there was a highly significant correlation in CRF patients without hepatitis with those who had hepatitis C virus $p\_$ value 0.003.

Keywords: Zinc; Copper; Iron; Viral Hepatitis; Liver Enzymes

Evaluation of the activity of alcoholic extract of Gujarat plant(Hibiscussabdariffa L.) against some dermatophytes

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Abstract. The present study highlighted the inhibitory effect of alcoholic extract of the calyx leaves of *Hibiscussabdariffa* L. against the growth of some dermatophytes fungi isolated from the skin, head hair and nails. During this study four cutaneous fungus was isolated and classified from the skin   :- *Trichophytonmentagrophytes*, *Trichophytonrubrum, Microsporumgypseum and Microsporumcanis.*Three concentrations of alcoholic extract of Gujarat plant (5, 10, 15) mg / ml were tested by mixing it with fungus medium. The study showed that the alcohol extract of Gujarat had an inhibitory ability on isolated fungi skin, and the highest rate of extracted effect was at the concentration of 15 mg / ml where the colony appeared as small white fungi isolation of *Trichophytonmentagrophytes* and *Microsporumgypseum*, while the lowest rate of effect extracted at a concentration of 5 mg / ml was on *Microsporumcanis*. The results showed that, using several chemical reagents of the alcoholic extract contains alkaloids, tannins, kalekosides and phenols and did not contain saponins and resins. The present study concludes the high efficiency of alcoholic extract of Gujarat plant in its effect on the growth of dermatophytes.

In vitro antibacterial activity of some spice extracts against methicillin-resistant Staphylococcus aureus isolated from nose of food handlers

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Abstract:

Background: Nasal carriage of methicillin-resistant *Staphylococcus aureus* among food handlers working in restaurants and cafeterias are the primary source of food contamination and food poisoning .

Objective: This study was conducted to evaluate the prevalence of nasal carriage of methicillin-resistant *Staphylococcus aureus* among food handlers working in restaurants and cafeterias, and to explore the antibacterial activity of cinnamon and ginger extracts against these bacteria.

Material and Methods: A total of 125 nasal swabs were collected from healthy food handlers , *Staphylococcus aureus* , methicillin-resistant *Staphylococcus aureus* (MRSA) were detected using standard methods. The antibacterial activities of aqueous and ethanolic spice extracts were evaluated against MRSA by using agar well diffusion method.

Results: of 125 nasal swabs, 40 (32%) isolates were *Staphylococcus aureus* , among which 30 (75%) isolates were MRSA. Both spice extracts showed potent antibacterial activity against MRSA.

Conclusion: This study revealed a relatively high prevalence rate of MRSA nasal carriage among food handlers. . Cinnamon and ginger extracts had potent antibacterial activity toward MRSA , therefor can be used as a natural food preservatives and to treat infections caused by MRSA.

Keywords: Nasal carriage, Food handlers, *Staphylococcus aureus*, MRSA, Cinnamon, Ginger and Antibacterial activity.

Comparative study between summer and winter of selected Heavy elements in water, sediment and two species of aquatic plants collection from Al-Gharraf River near Al- Gharraf oil field- Thi-Qar province – Iraq

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Abstract

The present study was deal with Concentration of some Heavy elements (Cd, Pb, Ni, Zn) in water, sediment and two species of plant (*Phragmites australis* and *Ceratophyllim demersum*) . in water, sediment and two species of aquatic plants collection from Al-Gharraf River, samples were collected of three stations in Al-Gharraf River to investigates the possibility of pollution in this area with these elements .three station (Al-Fajr districts, Qal'at Sukkar districts and Al-Rifa'I districts) were chosen to execute this study during the period from winter and summer 2019. Some physical and chemical variable of this river in water (water Temp. , pH, Salinity, DO, BOD$_5$) were measured in the study area, also total organic carbon was measured and the result expressed as a percentage . The high water temperature was recorded (17.00 $^°$C in winter to 26.33 $^°$C in summer), pH (7.44 to 7.73) and salinity (0.66 to 1.66)ppt, DO(7.06 to 3.07), BOD5 (4.34 to 2.91). Also, all the Heavy elements recorded a significant increase in water and *Ceratophyllin demersum* plant samples in the winter higher than summer and in the sediments and *Phragmites australis* plant the rise in the winter was only in the elements nickel and zinc, but in cadmium and lead were concentration low or do not make a big difference in the winter compared to the summer. Where there is a positive relationship between the increase in concentrations of Heavy elements in the samples studied and increase in the amount of rain, speed of runoff and the rise in water level in the river in winter due to the volume of rising smoke as a result of pollution which descends during the rainfall and erosion of the edges of the river and lack of control over the domestic sewage that has been brought into the river. As well as probable cause to exist Al-Gharraf oil field that newly established and located north of Fajr city, was considered a control station and opposite to the Qal'at Sukkar city and south of Al-Rifai city we can be observed through the results which show a gradual rise in the second and third stations and the third station was higher than stations 1 and 2.

Keywords: Heavy elements, Water, Sediment, *Phragmites australis, Ceratophyllim demersum*, Al-Gharraf River and Al- Gharraf oil field

Determination of oleaginous from non-oleaginous fungi using enzymatic and microscopic techniques

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Abstract

The current study was showed that the most fungal isolates that isolated from agricultural soils belong to Deuteromycetes, where *Aspergillus terreus* was appeared with 21.73 % and 43.23 % frequency and occurrence ratio respectively followed by *A. niger* with 17.39%, 35.7% of frequency and occurrence respectively. Moreover, fungal isolates that included *A. fumigatus*, ,*A. terreus*, *Cladosporium ramotenellum* and *Lichtheimia corymbifera* were revealed the highest productivity in the catalyse medium for the production of lipase .on the other hand, *A. terreus* was recorded the highest lipase composition with 47 mm of precipitation zone around colony on Congo red agar, as well as it was gave positive results of Sudan black B stain. Furthermore, the selected oleaginous fungal isolates were showed accumulative capacity of lipids reached to 23 % when cultivated in wheat straw medium as natural fermentation medium.

Keywords : Oleaginous fungi, non-oleaginous fungi ,congo red, sudan black B

Isolation and Antimicrobial susceptibility Profile Shigella spp. from children under five years with diarrhea in Al-Nassiriyah City

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ABSTRACT

The present study aimed at isolation and identification of *Shigella spp.* from human children with diarrhea and characterization of the samples using biochemical and molecular characterization techniques. our study was carried out during the period from November 2017 to May 2018. 400 fecal samples were collected from children aged (1day-5 years) of both sexes (216 Male, 184 Female) that had suffering from diarrhea in Mohammed Al -Mosawi Hospital and public health lab. in Al-Nassiriyah City. fifteen isolates (3.75%) were diagnosed as genus *Shigella* by using API 20E , VITEK2 systems and molecular detection by using *ipaH* gene. Antimicrobial susceptibility testing done by using 9 Antibiotics from different classes showed that all isolates were resistance to Ampicillin and Nalidixic acid, however all were sensitive to Chloramphenicol, resistance percentage to Cefotaxime, Gentamicin, Amikacin, Ceftriaxone, Ciprofloxacin and Tetracycline at (40%), (40%), (33.3%), (33.3%), (26.6%) and (20%) respectively.

Keywords: *Shigella* spp., antimicrobial susceptibility, *ipaH*

Effect of different types of fat on lipid metabolism in rats

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Abstract

This study was conducted to inquiries and to determine the influence of different edible oils in experimental animals. A Total of 60 albino rats that were randomly divided into 6 groups of 10 animals. The groups were fed on dietary without fat(control) (Group I), corn oil (Group II), butter fat (Group III), refined palm oil(Group IV) sunflower oil (Group V) and frying fat more than one for 8 weeks. After 12 h of diet removal, blood was collected to measure serum lipid profile (T.C., HDL, LDL and T.G.) levels. Rats of Group A were kept as control by feeding rat normal chow diet. Animals (rats) of groups B, C, D, E & F where fed by corn, butter, palm, sunflower and frying fat more than one oils respectively, at the dose of 15% in feed for 8 weeks. The procedures   included determination of body weight gain, lipid profiles and histopathological lesions in different organs. All experimental rats displayed advance or delay weight gain during the research period depending on type of oil. GC & GF oil treated group show highest significant (P□0.05)body weight gain, while GB, GD& gE show lowest significant(P□0.05, (P□0.05, P□0.03)Respectively than control group. Rats fed on diet include butter fat and frying more than one had the increment levels of TG, TC & LDL, and lower the HDL level than control group. On the other hand, corn, palm, sunflower oils led to the lower levels of TG, TC & LDL, but   the same oils or viz (corn, palm, sunflower oils) had increased the HDL level as compare to control group.

Anyway, dietary intake of vegetable oils improved lipid profile, while butter fat and frying more than one had the contrary impact.

Key words; Lipid profile, fat, oils, histopathology, body weight

NEW RECORD OF THE Genus Pullimosina Roháček, 1983 (DIPTERA, Sphaeroceridae) FROM KERBALA CITY, IRAQ, Study in Forensic Entomology

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ABSTRACT

This study aims to know the types of insects belonging to the Sphaeroceridae family. During this study, one species registered for this family for the first time to Iraq (New genus and species). It is using two methods of killing are injurious machine (knife) and toxic substance (strychnine). Four areas within Karbala governorate studied and identified to know their spread and time of presence on the body during the stages of decomposition. During this experiment, the bodies of dogs used to identify types of insects attracted to the body during four seasons. The results indicated the presence of the species *Pullimosina heteroneura* (Haliday, 1836) in the first three stages of decomposing the bodies, but in different proportions and the highest was in the wet decomposition of the body for the spring and autumn seasons.

Key words: Diptera, Forensic Entomology, *Pullimosina,* Iraq, Sphaeroceridae.

Ultrasound-guided brachial plexus blocks in pediatric anesthesia: non-systematic review

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Abstract

Background: The ultrasound guidance for regional anesthesia has gate a widespread as a recent technique to identify, visualize, and monitoring targeted nerves, needle insertion local anesthetic injection and distribution, catheters and adjacent anatomical structures, and helps to avoid complications such as inadvertent intravascular or intrafascicular injection in comparison to other traditional techniques.

Purpose of review: To show and explain if any superiority has added to brachial plexus approaches with this sonography guidance for the pediatric population over other traditional techniques in terms of increasing the success rate or reducing the complications.

Methods: Three authors[1] independently searched the literature using MEDLINE and EMBASE bibliographic databases, Cochrane Central Register of Controlled Trials (CENTRAL), and manually in either the title or abstract, we also searched Google Scholar, Web of Science and reviewed the references of included trials for potentially relevant trials.

Results: Reviewed literature suggests that ultrasound-guided peripheral blocks reduce block performance time in comparison with nerve stimulation, increase the success rate, reduced intended LA agent, and increase the quality of the block (as measured by analgesic consumption, block duration, and pain scores).

Conclusion: The introduction of ultrasound imaging improved the safety profile, reduced performance time, and advanced the upper limbs block approach.

Keywords: Ultrasound, regional block, brachial plexus, upper limb, upper extremities, pediatric anesthesia.

Molecular Typing and Antimicrobial Susceptibility Patterns of Escherichia coli Isolated from patients with urinary tract infection.

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Abstract

Escherichia coli (E. coli) represented most widespread microbes in the world, capable to cause varies disease such as intestinal or extraintestinal disease and also to be opportunistic infection. This study was conducted to isolate *E. coli* from urine of patients with urinary tract infections at Al- habbobi Teaching Hospital, during the period from November 2018 to March 2019, to detect Phylogenetice groups for isolates and susceptibility to antibiotic. A total of 127 samples patients were collected from urine gave 40 (31%) *E. coli.* Phylogenetic analysis basedw on the presence or absence of *chuA, yjaA* and *TspE4.C2* marker genes, was carried out to 40 isolates of UPEC, showed that Phylogenetic group B2 was most, predominant, which included 30(75%) isolates, group A 5(12.5%) isolates and group D 5(12.5%) isolates. Antibiotic resistance exhibited group B2 was resistance 97% to Augmentin, 97% trimethoprim, 87% tetracycline and ceftriaxon 80%. Group A and D 100% resistance for each of the Augmentin, trimethoprim and tetracycline. Group A resistance 20% to ceftriaxone and group D was 100%. In This study the phylogentic group of *E. coli* B2 the majority predominated in UPEC and large resistance to antimicrobial.

Key words: Phylogenetic typing groups, Uropathogenic *E. coli* , Antibiotic resistance

Seroprevalence and Risk factors of Toxoplasma gondii among children in Al-Qadisiyah Province – Iraq.

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Abstract:

Background: Toxoplasmosis is a disease associated with the nature of the population, domestic quality and generally health culture. *Toxoplasma gondii* causes many healthy and psychological problems, with the possibility of transmission from the mother to her fetus. The primary objective of this study is to establish a database of infection rates among the governorate's children, with the absence of a database of the parasite prevalence rate among children.

Materials and method:

463 serum samples were collected during the period from 6 Jan. 2019 to 12 Dec. 2019, all of which were examined by ELISA test to detect immunoglobulin IgM and IgG. All results were analyzed by SPSS20.

Results:

The current study referred to high prevalence rates of *T.gondii* (23.3%), where the ratios of IgM and IgG were (4.1% and 17.9%) respectively. Compared the present rates of the immunoglobulin with a gender, age, environment and animal contact.

Conclusion:

Our current study registered high prevalence rates among children in Al-Qadisiyah governorate, the results represent a database of researchers and workers of health. It's the first study concerning the prevalence of toxoplasmosis in children in Al-Qadisiyah governorate.

Key words: *Toxoplasma gondii*; seroprevalence; children; risk factors.

Molecular Identification and Phylogenetic Analysis of Rotavirus in Children Suffered from diarrhea under Five Years Old in Thi-Qar Province, of Iraq

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Abstract

The objective of this study is to determine the frequency of the one most important enteric viruses (rotavirus group A) in stool specimens of children aged less than five years, age,sex-related distribution, seasonal pattern, and clinical symptoms. A total of 100 fecal specimens (including 63 males and 37 females) are collected from infants and children under five years of age in Thi-Qar Province south of Iraq during Five Months (From November 2017 To March 2018). According to diarrhea suffered children which revealed that 45% are caused by Rotavirus, the frequency of male children patients with diarrhea caused by rotavirus was higher than their female. The samples are categorized into eight groups according to the age of the children: 1-5 months, 6-10 months, 11-15months, 16-20 months, 21-25 months, 26-30 months, 31-35 months, and 36-40 months. Age-specific frequency in children patients with diarrhea, caused by rotavirus is high in aged 11-15 months. According to results the percentage of infection with rotavirus show that 16 (35.6%) children are fed on Breast feeding, 22 (48.9%) children are fed on bottle feeding and 7 (15.6%) children are fed on mixed feeding. RT-qPCR is performed for the detection of Rotavirus based on the capsid gene. Also, RT-PCR technique is performed on some positive isolates in RT-qPCR method used for Rotavirus genotyping by using DNA sequencing analysis. In Rotavirus phylogenetic tree analysis, results show that the local Rotavirus isolates (IQ-C1) are closed related to NCBI-Blast Rotavirus (JQ069617.1) (EF472951.1) that related to (genotype G9P8-G9) with NCBI-BLAST Homology Sequence identify (99-100%) and submitted into NCBI-Genbank and provided accession numbers (JQ069617.1-EF472951.1).

Keywords: Rotavirus, RT-qPCR, capsid gene, diarrhea.

Isolation and identification of polyhydroxyalkanoates producing bacteria from biopolymers waste in soil

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Abstract: The production of polyhydroxyalkanoates PHAs from biopolymer degrading bacteria was examined *in situ* by screening isolates using Sudan B Black staining process as potential PHAs detecting, and Nile Blue staining as a proof method detection. Five bacterial strains isolated from biopolymer waste buried in a garden soil were able to produce high rate of PHA. *AK1P* and *AK2P* strains demonstrated high productivity of biopolymer by converting 5% (w/v) lactose as the only carbon source to PHA during fermentation. *AY2P* strain converted 5% (w/v) of glucose with less PHA accumulation. The favorite temperature for those strains to produce a high rate of PHA was at 30º C.

Keywords: Polyhydroxyalkanoates (PHA); Nile Blue A; Sudan Black B; biopolymer; lactose; glucose

The role of interleukin-33 in chronic viral hepatitis B Patients

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Abstract:

Objectives

The aim of the current study was to determine the serum level of cytokine IL33 in patients with chronic HBV infection in comparison with the levels of this cytokine in healthy controls, assess the correlation between the levels of the cytokine IL-33 and liver enzymes which include ALT, AST, ALP, TSB levels and the viral load in the patients group.

Background

Hepatitis B virus (HBV) infection often leads to chronic infection, and cytokines have essential roles in viral infections. The interleukin 33 (IL-33) is a member of the IL-1 family, and have a pleiotropic function which influent in both innate and adaptive immune responses, many studies confirmed that the IL-33 involved in response to viral infections.

Materials and methods

The untreated chronic hepatitis B patients collected from Baghdad-medical-city, Hepatolog and Gastroenterology Teaching Hospital,
The level of IL -33, viral load, and level of liver enzymes were measured.

Results

IL-33 significantly increased in the chronic hepatitis B patients group than the healthy control group (P<0.0), this study did not observe any correlation between serum IL-33 level with ALP, AST, ALT, TSB and with viral load. The biochemical test results, ALT, AST, and TSB levels showed non-significant differences between the patients' group and the control group, while alkaline phosphatase (AP) has highly significant differences between the control group and the total of patients.

Conclusion

 Our data indicated that serum level of IL-33 elevated with the in patients with chronic hepatitis B in comparison with healthy and there was no significant correlation between this interleukin (IL-33) with liver enzymes, and finally, there was no relation between viral load and IL-33 concentration.

Keywords: Hepatitis B virus, Interleukin-33, Viral load, Liver enzymes.

Preterm premature rupture of membranes management with erythromycin versus azithromycin

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Abstract:
Background:- One of the important pregnancy complications is the preterm premature rupture of membranes, the prevalence is 2%-3% .some advocated to manage with the azithromycin because it is administered easily and has lesser side effects with a lower cost than the erythromycin.

Objective: We assessed the latency period between the preterm premature rupture of membranes until delivery of those patients managed medically with azithromycin and erythromycin in different doses.

Study design: It was a retrospective cohort study.

Setting: This study was designed in the yermook hospital from April 2019 to September 2019 for about six months' duration.

Patients and Methods: Collection of women who diagnosed with preterm premature rupture membrane (PPROM) at gestation between 23 plus 6 days to 33 weeks plus 6 days, then for all patients the demographic parameters collected as well as the maternal risk factors, complication of the preterm birth with the calculation of the latency period, with other parameters as gestational age of delivery, the mode of delivery, clinical chorioamnionites, the weight of baby at birth, and the fetal complications, Apgar score at 5 minute, neonatal respiratory distress syndrome, intraventricular hemorrhage, sepsis and, neonatal death. Then we classified the women into four groups; group (1) were on 1000 mg oral azithromycin orally as a single dose, group (2) on 500 mg azithromycin for one day then 250 mg azithromycin orally daily for four days, group (3) were on 500 mg azithromycin intravenously for two days, then put on 500 mg azithromycin orally for five days, last group were on 250 mg erythromycin orally every six hours for two days, then 333 mg erythromycin every eight hours for five days.

Results: The 169 patients were enrolled to our study after diagnosed with PPROM, the gestational ages were greater than 23 weeks .classification of patients into four groups, we found that Patients in group (3) were older, less likely to have chronic hypertension, pregestational diabetes than patients in other groups, and the gestational age at membrane rupture was later than other groups, with a p-value <0.001.there was a significant statistical difference among the groups about latency as the P-value 0.02, four days was the median period from rupture of membrane until the delivery for patients on Azithromycin for 5 days while five days for the rest of the groups. As well as the gestational age at delivery showed a statistically significant difference between the groups as the P-value was 0.001.

Conclusion: Here in our study no differences were found between the four groups of women treated with azithromycin and erythromycin in different regimens of dosing, in latency until the delivery, chorioamnionitis incidence, outcome of the neonate. Azithromycin can be regarded as

an alternative antibiotic instead of erythromycin if contraindicated or if not present, particularly in cases of expectant management of PPROM, as single or multiple doses.

KEYWORDS: Preterm premature rupture of membrane, Azithromycin antibiotics, erythromycin antibiotic

Synthesisg ofg silverg nanoparticlesg fromg Streptococcusg pyogenesg andg antimicrobialg activity

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Abstract

The use of microorganisms like bacteria in the synthesis of nanoparticles emerges as an eco-friendly approach and an alternative to the chemicals method . In the present study , reported the biosynthesis of silver nanoparticles (AgNPs) using the *Streptococcus pyogenes* . Silver nanoparticles were synthesized through the reduction of aqueous Ag + ion using the bacterial culture supernatants at room temperature.

Synthesis of AgNPs was initially observed by color change from yellow to brown which was confirmed by UV-visible spectroscopy The silver nanoparticles were further characterized using Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopic (SEM) analyses and X_ ray diffraction (XRD). The synthesized nanoparticles were found to be spherical in shape with a size in the range of 20-100nM. The synthesized AgNPs were found to have antibacterial activity against two tested pathogenic bacteria (Gram negative bacteria *E.coli* and Gram positive bacteria *S. aureus* .

Efficiency of bio-evaporation of Arugula leaves to control root rot disease on cucumber caused by Pythium intermedium in Greenhouse

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Abstract

The efficiency of the Arugula (*Eruca vesicaria*) leaves extracts against the fungus *Pythium intermedium*, the root rot disease agent, was evaluated with three concentrations of 2.5, 5, 10 g / kg soil as biofumigation. The fungi around infected root of cucumber plants were isolated and diagnosed from different locations in Baghdad such as Rashidiya, Madaen, Yousifiya and Mahmudiya. The extract of arugula plants significantly reduced the incidence and severity of root rot disease on cucumber plant after 45 days of cultivation compared with control. The highest reduction in incidence and severity of the disease was about 4% and 5% respectively with arugula extract 10 g / kg soil. The study was the first record to evaluate the incidence of *P. intermedium* on root of cucumber plants in Iraq. Further, all concentrations of arugula extract showed increase on the growth parameters compared with control. In arugula extract 10 g/kg soil the growth parameter such as plant length, leaf length, leaf width, wet weight and dry weight were 35 cm, 5.5 cm, 6 cm, 4 g and 0.28 g respectively. Furthermore, Significant differences in the value of the biological index of arugula plant extract treatments ranging from 2627 to 3433 compared to the treatment of *P. intermedium*, which was about 1910, while did not differ significantly from the treatment of control with a vital index of 3830.

Key words: biofumigation, Arugula extract , *Pythium intermedium*, cucumber

Molecular detected of heat shock protein70 gene in Layer hens (Lohmann breed)

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Abstract

The polymorphisms of the *hsp70* gene have been associated with diverse resistance of heat stress in hens. The aim of the current study was to explore the genetic variation of the *hsp70* gene in Layer hens that bred in Iraq. One hundred-fifty Lohmann breed hens aged 12 months were used in this study. Blood samples were collected during the period from 1st September to 31st December 2018 and examined for detection the polymorphism of hsp70 gene. We have detected four main polymorphisms groups in the coding region of *hsp70* gene among these layer hens. A significant association between the silent and the missense mutations with the polymorphisms of *hsp70* gene in Layer hens was found. There was a high homology of the *hsp70* gene sequences that obtained from our local layer hens with the related sequences obtained from different hottest and coldest areas. In conclusion, this study demonstrates that the different mutations (silent and missense) in the coding region of the *hsp70* gene of these local Layer hens predict improve birds'ability to the tolerance of stress conditions, and highlights the need of further investigations.

Keywords: HSPs, hsp70 gene, Polymorphism, Layer hens, Stress condition

Some biochemical parameters and genetic aspect of ventricular septum defect patients in Thi-Qar province, Iraq

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Abstract

The present study aimed to investigate some of the biochemical and genetic aspects of patients with a ventricular septal defect in Thi-Qar province, Iraq. The sample includes 75 patients who were attending Al-Nasiryiah heart center, during the period from December 2017 to March 2018, with 41 healthy as a control group. The result indicated a significant increase (at P≤0.05) of TG, HDL and VLDL in VSD patients compared with the control group. while non-significant differences in Cholesterol and LDL in VSD patients compared with the control group. The results showed a significant increase (P≤ 0.05) of ALT, AST, ALP (at P≤ 0.05) in VSD patients compared with control. This study was conducted to identify the potential association of *GATA4* gene SNPs with the progression of the ventricular septal defect (VSD) in Thi-Qar province in Iraq. One genetic locus covering 478 bp within the intronic region of the *GATA4* gene was amplified and sequenced from both termini. Out of 20 sequenced samples in this locus, only one SNP was observed, namely rs10503425, which was found to be known with its association with VSD. The online available records of this SNP has indicated its pathological correlation with the progression of this congenital disease. The current results indicated that the distribution of the observed rs10503425 was only found in 6 examined samples, including samples no. 7, 10, 13, 14, 17, and 19. In conclusion, this observation may unmask more confirmation about the particular involvement of this discovered SNP in the progression of VSD in Thi-Qar population.

Keywords: Ventricular septal defect, Genetic aspect, Biochemical parameters.

Activity of some natural products and their toxicity in controlling Colletotrichum gloeosporioides Penz.

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Abstract

Three ethanol extracts (concentrations 500-5000 ppm) from *Eucalyptus camaldulensis* L., *Nerium oleander,*L*(*Oleande*r)* and *Ricinus communis.*L (Castor) were evaluated for their anti-microbial activity on the fungus *Colletotrichum gloeosporioides* Penz. The toxicity (LC50) of these extracts was determined using the (BST) Brine Sharimp test. Crude extraction of Oleander and Castor plant showed a complete fungal inhibition zone in PDA medium at 3000ppm (100%) in the mango anthracnose in *vitro ,*while Eucalyptus recorded more than 80% fungus inhibition. The LC50 value of those extracts was ranged from 5 mg/ml to 495mg/ml, levels that were for below the hight toxic level of 0.2 mg/ml based on their safe levels fungal inhibition of *Colletotrichum gloeosporioides*. The botanicals can be considered as alternative to synthetic in future researches.

Keyword - Mango anthracnose, synthetic fungicides, botanicals, Environment pollution, eco-friendly.

The effects of Hookah Smoking on Liver functions, Lipid profile & Blood Contents in adult

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Abstract:

Smoking is the major habit widespread among people affecting the Human body, and the risks to health. Our study was aimed at showing the effects of hookah (Shisha) smoking on the functions of the liver, lipid profile and blood content compared to adult non-smokers. **Materials and Methods:** This study was involved 50 males, their age range between 30–60 years. The samples was divided into two groups:(30-shisha smoker) group and (20) nonsmokers group. Each male undergo to detailed medical history questionnaire list and routine investigations to rule out any underlying diseases and excluded any diseases, A volume of 10 ml of blood samples were collected, 3ml of blood samples put in red tube(with anticoagulant factor) to examine the blood contents(Hb, PCV, RBC, WBC, ESR, Plat., LYM, Monocyte, Neutrophil, Eosinophil, Basophil),and 7ml of blood samples put in in dry tubes, after centrifugation, the serum were frozen at −8°C until analysis, Biochemical parameters including serum for (TC, TG, HDL, ALK, AST, ALT, Albumin, TSP , urea ,CK, CPK, LDH and Glucose) were determined by enzymatic methods using Randox kit, **Results:** Results showed that there were increased in Hb, PCV, WBC, ESR, Platelets and decreased in RBC, there were significant elevated in ALP, and non-significant increasing transaminase enzyme. About the results of lipid profile there were increasing in TC, TG but non significantly. Our analysis concluded our findings were highly variable. Such differences may be due to other factors. Our results were to explain the smoking implications of further research centering on the relationship between the roles of organs and their work tests. Further studies also need to consider age, sex, diet and inheritable habit.

Key words: Hookah, smoker, blood, shisha

The Rainfall Erosion of Polish Soils (2006-2016)

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Abstract

The study aims to live the rainfall erosion effect on Polish soils from (2006-2016). the very best Rainfall erosion in Polish cities were in Kasprowy Wierch and Śnieżka (1722.4, 579.59 MJ mm ha-1 year-1) respectively, thanks to high sand content and low clay content increased the likelihood of abrasion , while the less were in Łeba, Sandomierz, Racibórz and Jelenia Góra (19.59, 21.307, 25.14,25.28 MJ mm ha-1 year-1) respectively. The rainfall effect more on polish soil thanks to continuing mainly sand and silt texture with small percentages of clay.

Key   words: Polish   soils,   Rainfall   erosion.

Genetic variations of the mtCOX1 gene for Iraqi patients with tetralogy of Fallot

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Abstract

Objective: Numerous evidence suggests that tetralogy is associated with different genetic factors. Therefore, this study was designed to determine the potential role of genetic variations in some mitochondrial genes *mtCOX1* and their association with tetralogy.

Materials, methods of work and results: The study included 20 patients with tetralogy of Fallot and 20 healthy volunteers as a comparison group. The results of the molecular analysis showed that there are thirteen mutations in the mtCOX1 gene, of which eight are not previously recorded. The variations were as follows: transition of G>C at locations: 6690, 6825, and G>A at locations: 6915, 6917, 6261, and transformation of G> T at locations: 6899, 6922, the transversion of T>C at locations: 6632, 6297. and T>G in a location: 6674. and A>T at locations: 6843 and 6804. Deletion of a nitrogenous base (C) at site 6927 del C This variance was recorded at the National Center for Biotechnology Information Clinical variation (NCBI) with accession number (SCV000845754).

Conclusion: The occurrence of genetic variations in the *mtCOX1* gene, such as deletion and addition mutations, led to mutations that shifted the reading frame may constitute an inheritable risk factor for the pathogenesis of tetralogy infection.

Keywords: Tetralogy of Fallot, genetic variants, *mtCOX1*, mitochondria

Abbreviations: TOF, Tetralogy of Fallot **;** del,deletion; OXPHOS, oxidative phosphorylation ;COX, cytochrome c ; ROS, free oxygen radicals ; bp, base pair ;

Using the magnetic and nanotechnology in the treatment of wastewater and its effect on the growth and yield Vigna radiata L.

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Abstract :

Two laboratory experiments were conducted, the first to obtain the best concentration of nanomaterial's used Fe3O4 in removing heavy elements from wastewater, and the concentrations were (50, 100, 150, 200, 250) mg.L^{-1}, and the concentration was chosen 100 mg. L^{-1} was the best concentration after achieving the highest rate of removal of heavy elements from wastewater, and the second to test the effect of treated nanoparticles and magnetic particles, and the interference between them in the germination rate of livestock seeds used as a biomarker in sterile plastic plates at a rate of three iterations per treatment and experiment parameters were water treatment River T0 and T1 treatment untreated wastewater and T2 wastewater treatment with nanomaterial's treatment, T3 magnetic treatment wastewater treatment and T4 treatment, which overlap between the two treatments, and T3 and T4 treatments achieved the highest germination rate of 100% for the two treatments. A field experiment was conducted in Al-Mu'tasim area, 20 km south of Samarra - Salah Al-Din area located at latitude 3771307 and longitude 413224 in July 2019 to see the effect of experiment treatments on some characteristics of the growth of *Vigna radiata* L. plants, and the results showed that the T4 treatment significantly exceeded all treatment treatments in Some plant growth characteristics such as plant height, leaf area, dry vegetable weight, dry root weight and percentage (43.00, 14.60, 77.95, 71.87)% for trait respectively when compared to T1 treatment which achieved lower mean for the mentioned traits.

Keyword: Fe_3O_4 , Magmatic , Wastewater, Mungbean

The role of Baicalin in reproductive organs in male white rats treated with Gemcitabine drug.

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Abstract: Eighty (80) male Albino Rats (*Rattus norvegicus*), were used in this study with ages (10-12) weeks, and their weights were of (175± g), the animals were randomly distributed to eight groups equally. The present study aims to identify and evaluate the protective and immunological role of Baicalin extract in reducing the toxicity of Gemcitabine on the body and reproductive organs and minimizing its side effects in male Albino Rats. At the end of each treated and control groups period, male rats were anesthetized (by injection of 0.3ml ketamine + 0.1 ml of xylazine/ kg b.w.), The animals dissected and enucleate the testis, epididymis and remove all the connective and adipose tissues around them. Rights testis and epididymis tissues kept in formalin 10% for histological study. The results of the histopathological examination showed significant changes in both the testicular tissue and the epididymis groups of study. The results of the current study showed a significant improvement ($P < 0.05$) in the treatment groups which were given Baicalin extract at a concentration of 30 mg / kg bw for 30 and 60 days respectively compared to the treatment groups which were given Gemcitabine drug. As a Conclusion, administration of Baicalin has a high efficiency in reducing the oxidative damage caused by toxicity of Gemcitabine drug on histological and reproductive functions.

Prevalence of Cyclospora cayetanensis parasite in human, animals, and vegetables in Anbar province / Iraq

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ABSTRACT

This study aimed to investigate *Cyclospora cayetanensis* parasite in Anbar Province by examining 560 stool samples (262 males and 298 females). These samples were collected from patients coming to hospitals in Ramadi, Falluja, and Haditha in 2017. The results showed that the infection rate was 12.1%, there was no significant difference between males and females. The age group (1-9) years old had the highest incidence rate of 25.8% and significant differences (P ≤0.05). The infection rate in rural areas was 14.5% higher than in urban areas which were 8.4%. Also, the highest rate was 41.5% in April and the lowest was in November 2.5%, while the summer months did not record any infections. The study also included an examination of 188 samples of animal feces (48 sheep, 50 cows, 47 goats, and 43 dogs). The parasite was not diagnosed in any of the examined animals. This study might be considered the first in the country where the parasite is investigated for goats and dogs. The study also included, for the first time in the country, the investigation of this parasite in five types of vegetable leaves (garden cress, Radish, leek, green onions, and purslane). The presence of Oocyst was in vegetables wash water (6, 7.8, 7.2, 4.4, and 3.2) Oocyst/ liter respectively.
Keywords: prevalence, *Cyclospora cayetanensis*, human, Animals, vegetables.

Fluid Therapy for Major Abdominal Surgery: A Narrative Review

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Abstract

Fluid therapy is a crucial key in anesthetic management during general surgery because most of assessment studies and trials had a conclusion of the important role of fluid administration and replacement during surgery to improve patient outcomes. In many protocols, fluid therapy in the perioperative period of major surgery is managed by the anesthesiologist. To create an effective plan for the liberalization of fluids during major surgery require good conservation and knowledge of fluid physiology in the human body as well as knowledge of the basic characteristics of all available intravenous fluids, understanding type of surgery and related effects. The general objective of our review is to find the outline of essential basics for fluid therapy during prolonged surgical procedures. Avoidance of fluid and electrolyte imbalance, sufficient tissue perfusion and continuous normality of homeostasis are the most important targets of fluid infusion for anesthetized patients. Colloid or crystalloid? Is still an argument in this field due to the paucity in results from studies to pinpoint the appropriate volume and type of fluid? For this reason, encouragement for more clinical trials is existed and also to appear by a substantial definition for restrictive and liberal fluid therapy. In the last decades, balanced crystalloids are more preferred to compensate for the fluid loss according to most depending trails, but in a restricted plan during surgery.

Keywords: Major surgeries, fluid replacement, liberal method, restrictive method and IV fluid.

Infraclavicular Brachial Plexus Block for Upper Limb Surgeries in Adult Patients; non-systematic review

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Abstract

Background: Several techniques exist to produce local anesthetic blockade of the brachial plexus. The infraclavicular brachial plexus block is one of the common approaches that provides dense anesthesia for the upper limb (upper arm, elbow, forearm and hand). The goal of this study was to clarify the efficacy and safety of infraclavicular block (ICB) and to show if any superiority for this technique over other brachial plexus approaches in providing regional anesthesia for surgeries of the upper limb.

Search methods: **We searched the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library (2013, Issue 5); MEDLINE (1966 to June 2013) via OvidSP; and EMBASE (1980 to June 2013) via OvidSP. We searched Google Scholar, Web of Science and reviewed the references that compared ICB with other BPBs as the sole anesthetic technique for the upper limb surgeries.**

Result: Infraclavicular block is as safe and effective as any other brachial plexus block, regardless of whether ultrasound or nerve stimulation guidance is used. It's associated with a minor possibility of tourniquet pain during surgery, more reliable blockade of the musculocutaneous nerve when compared to an axillary block, and a significantly shorter block performance time compared to supraclavicular block.

Conclusion: authors with consent concluded that Infraclavicular block can decrease the complications of peripheral nerve block and improve patient satisfaction during perioperative management. And can be considered as a Safe and effective technique.

Keywords: Infraclavicular block, Regional anesthesia, Upper limb surgery and brachial plexus.

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Susceptibility of ABO system for infection of COVID-19

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Abstract

Corona COVID 19 is a contagious viral disease caused via SARS CoV 2 appeared at Wuhan ,the chinese city, which has spread worldwide. SARSCoV-2 has been shown to be relatively associated with bat {SARS-like} viruses, and therefore bats may be a potential reservoir of infection. origin and transmission for humans is unknown, but rapid transmission from humans to humans has been confirmed widely. O glycosylation plays a major role in causing coronavirus infection, which creates an antigenic structure,virus can not survive outside its host and by default uses cells of the host. Host cell adhesion to the virus occurs mainly independently of blood type ABO via a genetically unspecified evolutionary structure , and appears to act as a pathogen host pathway functional for many contagious diseases. however, while susceptibility and severity depend on several factors such as individuals of A blood type who unable to respond to acquired or inherent antibodies for synthesize hybrid ((A-like)) formations due to the selection of clonal and plasma protein adaptation Thus individuals with a blood group A will be a preferred target of the virus that uses glycotransferase to phenotype, and leads to more hybrid correlation of the blood type A-allelic type of hybrid while associated O individuals with the lowest risk to be infected.

Key words : ABO system, SARS CoV 2, A antigen, ACE2 , blood group O

DETECTION OF SOME TYPES OF OILS THAT INDUCE LIPASE PRODUCTION IN SOME BACTERIAL ISOLATES.

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ABSTRACT

 Bacterial lipases are a highly versatile class of hydrolytic enzymes which catalyze the hydrolysis of triglycerol to glycerol and fatty acids. They play an important role in biotechnological and industrial processes, including oleo chemical, food, pharmaceutical detergent formulation, cosmetic, leather, textile, and paper industries applications. Tremendous interest among scientists and industrialists has been arisen in the last decade in microbial lipases due to their versatility and ease of mass production.

In the current work, natural oils such as Triglyceride, Tween 20, Tween 80, Olive oil, Sweet almond, Celery oil, Sesame, Rosemary oils were implemented to enhance lipase production by soil and pathogenic bacterial isolates. Results revealed that triglyceride and tween 80 had the best enhancing activity for lipase production in most isolates. It was also shown that Pseudomonas and Bacillus were the most potential lipase producing bacteria.

A novel modified tributary agar was prepared by the addition of Sudan blue dye and used for the detection of lipase producers. It was shown to give a very clear zone even in the case of weak producing strains as compared to the original medium.

Specific lipase activity had been determined *Staphylococcus aureus* (in the present research. The highest lipase activity was demonstrated by Pseudomonas (4.5u/ml), while *Staphylococcus aureus* did not show any lipase activity.

Keywords: Modified medium, Sudan blue dye, inducing oils, bacteria

Association of EBV with Hodgkin and Non-Hodgkin Lymphoma for Females and Males Patients: Histological, Molecular and Survey Study in Karbala, Iraq

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Abstract

Infection with Epstein-Barr virus (EBV) is closely related to different malignant lymphoma subtypes, such as non-Hodgkin lymphoma (NHL) and Hodgkin lymphoma (HL).   NHL and HL are among the world's most popular hematological malignancies. Originating from lymph tissue, with varied biological and clinical features. We aimed at determining EBV prevalence in NHL and HL. Present study classified in to two parts. Part I: survey study for (3 years) include 359 specimens (186 female and 173 males). In females found the percentage of NHL (35.1%) as compared to HL (64.9%). While in male, found HL (57.2%) as compared to NHL (42.8%). High significant differences (P≤0.0001) between HL and NHL in the age group (5-14). In females, high significant differences (P≤0.0001) between HL and NHL in the age group (25-34). The highest distribution of sites of lymphoma found in cervical lymph node for both gender. Part II: laboratory study includes 40 specimens divided in to four groups according to the gender and subtype of lymphoma. High significant differences in the age (P≤0.008) between HL and NHL of males, significant differences (P≤ 0.038) in the presence of EBV. High significant differences in the age (P≤0.001) between HL and NHL in females. In addition, significant differences in presence of EBV for both HL and NHL of males. While significant differences (P≤0.06) in presence of EBV found only in NHL of females.

Key words : Histology, Non-Hodgkin lymphoma "NHL", Hodgkin lymphoma "HL"

Involvement of PI3K and PLC pathways in focal adhesion turnover in breast cancer cell lines

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Abstract. Focal adhesions (FAs) are highly temporally organised and play a crucial role in cancer cell migration. PI3K and PLC signalling regulate many physiological processes. In this study, we demonstrated that PI3K and PLC pathways could be involved in the regulation of turnover and cell migration in luminal-like MCF7 and basal-like MDA-MB-231 breast cancer cell lines. We utilized pharmacological inhibitors to intervene with these signalling pathways and analysed the turnover of a FA resident protein (vinculin), cell migration and wound healing assays. Our results showed that FA turnover and cell migration significantly inhibited.

Evaluation of nanostructures for wastewater in removing heavy elements and their effect on pea plant growth(Pisum sativum)

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   Abstract:
The study was conducted to find out to what extent non-conventional water utilization in the agricultural field is possible, e.g., wastewater treated with nanomaterial alternatives. The research encompassed two laboratory experiments: The first one was to discover the efficiency of the nanomaterial used to remove heavy elements, such as (Cu , Mn , Zn), from raw wastewater and the laboratory concentrations were () mg $\times$ L^{-1}; and the second one was to test the effect of Nano-treated water on the percentage of pea seed germination in sterile plastic pots and three duplicates per parameter as a vital indicator. The experiment parameters included: (T1) tap water; (T2) raw wastewater; and (T3) Nano-treated wastewater using TiO$_2$. As for the third experiment, it was field-implemented by cultivating the plastic pots in the greenhouse of the Department of Life Sciences, University of Samarra, at the onset of January 2019 to see the effect of Nano-treatment, used on concentrations of the heavy element of zinc, on the vegetative parts of the local pea plant.

A new adsorption material based GO/PVP/AAc composite hydrogel characterization, study kinetic and thermodynamic to removal Atenolol drug from wast water

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Abstract

 Increased contamination of pharmaceutical compounds and their presence have led to real health problems .In this study used Poly (Graphene oxide /polyvinylpyrrolidone /acrylic acid (GO/PVP/AAc) as the innovator composite/ hydrogel, were tried out atenolol drug. It has been proven to be effective in laboratory elimination of solutions. The composite prepration via free radical polymerization by using Specific ratios between (PVP/AAc) hydrogel and graphene Oxide (GO). The innovator adsorbent was estimated characterized by FT.IR, and FE-SEM. A suite adsorption tests were studied using to performed the Optimal conditions Of which contact time, pH. Dosage of adsorbent , ionic strength, and temperature. The kinetic experimental data were carried out via two model first pseudo order and second pseudo order, the adsorption proocess followed Pseudo second -order kinetic model with correlation coefficients greater than 0.999. The adsorption isotherms of composite could be illustrated well by the Freundlich Langmuir and Timken equations, The process of Atenolol adsorption on composite was depended on Freundlich and Timken isotherms more than other. The study discusses the thermodynamic parameters including changes in enthalpy , , entropy, and Gibbs free energy.

Keywords: Atenolol, hydrogel, Cross-linking, GO, Adsorption, biological half-life, pollution. Graphene

DETECTION OF QUINOLONES RESISTANT AMONG GRAM NEGATIVE BACTERIA ISOLATED FROM CLINICAL SPECIMENS

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ABSTRACT

   The study was conducted through a period from July 2019 to December 2019, a total of 316 samples from various clinical cases of different patients were randomly collected and examined for detection of Gram negative bacteria .These clinical samples included wound swabs, burn swabs, ear swabs, sputum samples, stool, all collected samples were screened for presence of Gram negative bacteria by culturing on appropriate media and 94 Gram negative bacteria were identified via biochemical tests and confirmed by API 20E system. Overall, *qnr*-genes)quinolones resistance genes(were detected by multiplex PCR technique in 28/94 (29.78%) of all clinical isolates. However, the results showed that quinolones-resistance genes gave 25 positive results for *qnrB*, while 9 positive results for *qnrS*, but *qnrA* gene was not detected in any of the clinical isolates.

KEYWORDS:: Gram negative bacteria, Antibiotics and *qnr* genes

The effects of irisin on the transforming growth factor-beta1(TGF-β1) level in type-1 diabetic patients in Thi-Qar province.

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 Abstract

   The present study aimed at an assessment of irisin level in patients with the newly onset type 1 "diabetes mellitus" (T1DM) and their effects on the transforming growth factor-beta1(TGF-β1) level. This study comprised 60 individuals diagnosed in newly onset T1DM and 40 healthy contributors (control group). The patient group was divided into two subgroups according to age group G1(1-5) years and GII (6-10 years). The present study showed a significant increase (P ≤ 0.05) of FBS and glycohemoglobin (HbA1C) levels in patients with GI compared with the GII. So this study explained a significant increase (P ≤ 0.05) of FBS and (HbA1C) levels in patients with GI and GII compared with the control group. The present study showed a significant decrease (P ≤ 0.05) of irisin levels in patients with GI compared with the GII. So this study explained a significant decrease (P ≤ 0.05) of irisin level in patients with GI compared with the control group. While the results showed a significant increase P ≤ 0.05) of irisin level in patients with GII compared with the control group. The present study showed a significant decrease (P ≤ 0.05) of TGF-β1 level in patients with GI compared with the GII. So this study explained a significant decrease (P ≤ 0.05) of TGF-β1 level in patients with GI and GII compared with the control group. The present study showed a significant increase (P ≤ 0.05) of CRP level in patients with GI and GII compared with the control group. While the results explained a significant increase (P ≤ 0.05) of CRP level in patients with GI compared with the GII.

 Keywords: Irisin, T1DM, TGFβ1.

Synthesis, Characterization of a Novel 1,1'-[1,4-phenylenebis(1,3,4-thiadiazol-5,2-diyl)] bis (3-chloro-4-(4-hydroxyphenyl) azetidin-2-one and evaluation its Biological activities

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Abstract

In current study, synthesis of a novel azetidin-2-one compound, i.e 1,1'-[1,4-phenylenebis(1,3,4-thiadiazol-5,2-diyl)] bis (3-chloro-4-(4-hydroxyphenyl) azetidin-2-one from reaction of 0.002mole of 4,4'-[1,4-phenylene bis(1,3,4-thiadiazole-5,2-diyl)] bis (azaneylylidene) bis (methaneylylidene) diphenol with 0.004mole of 2-chloroacetylchloride in dioxane as a solvent in the presence of trimethylamine. The biological activity of new azetidin-2-one compound was evaluated at 100 mg/ml against four types of bacteria i.e. *Bacillus cereus*, *Staphylococcus aureus*, *Escherichia coli* and *Salmonella* sp. and its minimum inhibitory concentration (MIC) was 2, 2 ,3 ,3 mg/ml for *Bacillus cereus*, *Staphylococcus aureus*, *Escherichia coli* and *Salmonella* sp. respectively. Median lethal dose (LD_{50}) and cytotoxicity activity were also investigated. The LD_{50} for this compound is 1.4 gm/kg bw. The results showed that this compound did not affect the red blood cell until the concentration reach 25 mg/ml or above. The new compound was characterized by spectral data, i.e., FT-IR, ^{1}H-NMR, ^{13}C-NMR and elemental analysis which confirmed its proposed structure.

Keywords: Azetidin-2-one compound, Biological activity, Cytotoxicity, LD_{50}

DETECTION OF EXTEND SPECTRUM B–LACTMASE GENES TEM,SHV AND OXA IN ENTEROBACTRIACEA BACTERIA ISOLATED FROM UTI OF PREGNANT WOMEN IN AL-NASSYRIAH CITY

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ABSTRACT: This study was performed to detect the presence of TEM,SHV and OXA genes in *Enterobactriacea* causing urinary tract infections in pregnant women in Al- Nassyriah city , during the period from March(2020) to June(2020).Six hundred and thirty (n= 630) urine samples were collected and cultured on macConky agar for initial isolation.Morphological, conventional biochemical tests and the API 20 system were performed to identify the causative agents.Ninety samples showed positive culture, most common isolates were *E. coli* 57 (63.3%) followed by *Klebsiella pneumonia 21(23.3%), Klebsiella oxytoca* 4(4.4%) , *, serrtia marcesence*, *Proteus mirabilis* were 2(2.2%), *Citrobacter freuendii* and *Enterobacter clocae were* 1(1.1%) . Among *enterobactriacea* bacteria isolates, ESBLs were detected in 26 isolates (28.9%) of these ; *Escherchia coli* 17/57(29.8%), *Klebsiella pneumonia*e accounted 5/21 (23.8 %) , *Klebsiella oxytoca 1/4(25%), Proteus mirabilis*, *serrtia marcesence were* 1/2(50%) *and Enterobacter clocae* is 1/1(100%). DNA band had volume TEM(800 bp), SHV(713 bp) and OXA(564 bp).

KEYWORD : ESBLs, *Enterobactriacea*,Pregnant Women,UTI.

Rules of Pediatric Fluid Therapy: Non-systematic review

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Abstract

As an influential role in any surgical plan, intravenous infusion of IV fluids or blood transfusion for pediatrics undergoing elective surgery has been considered with dramatic effects on the results of surgical intervention. In their nature, IV fluids generally are drugs, therefore it is imperative that those interested in cardiac surgery patients have a good understanding of physiology and pharmacology of these drugs, in addition to physiological differences between adults and children with regard to body water and blood volume must be understood. Anesthetic management must include which type of fluid? How much to be infused, and the tonicity of used fluid, these three aspects are the main in fluid therapy plane. Optimal outcomes after surgery, such as shortened hospitalization and reduced morbidity rate, can be getting from precise planning before starting the surgical intervention. Avoiding hypovolemia or hypervolemia in the perioperative period can be achieved by using a mixture of different types of IV fluids, and this will be an ideal plan for fluid therapy the common recommendations in fluid type had been trending to use the Isotonic crystalloids with low glucose contents. If hypoglycemia is expected, Dextrose infusion is recommended under glucose level monitoring. To avoid accidental hypervolemia and related complications, using modern techniques in fluid infusion such as a syringe pump, has been strongly suggested recently during surgery.

Keywords: pediatric surgery, fluid therapy, IV fluids, crystalloids, colloids.

The Incidence of Postoperative Sore Throat after Local Application of Different Lidocaine Forms & Methods; a Narrative Review

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Abstract

Background: sore throat is a well-known complication of endotracheal tube after general anesthesia. Many pharmacological methods to reduce the incidence of sore throat with different lidocaine routes and formulas have used clinically by anesthesia providers. This review aimed to explain narratively the efficacy of various ways of lidocaine application in decreasing postoperative sore throat. **Methods**: All relevant and published data were independently searched by using MEDLINE and EMBASE bibliographic databases, the Cochrane Central Register of Controlled Trials (CENTRAL) and manually using the proper search terms in either the title or abstract. **Results**: We included 10 studies in this narrative review, involving 1266 participants. 543 of those patients received topical lidocaine therapy, and 723 were introduced as comparative or control groups. 23% (n=226) of lidocaine groups in 3 studies with different forms showed decreased risk of postoperative sore throat, 4 studies (39% n= 201) showed no longer significance and 3 studies (38% n= 207) showed increased the risk of postoperative sore throat. **Conclusions**: in our narrative review, most of the included studies showed that local anesthetic lidocaine can reduce the incidence of sore throat if used to inflate the endotracheal tube cuff or in combination with other pharmacological or technical ways such diclofenac sodium gel and thermally soften endotracheal tube.

Keywords: sore throat, lidocaine, lignocaine, postoperative, tracheal, endotracheal tube, Complications and general anesthesia.

Phenotypic and genotypic characterization of Acinetobacter baumannii Iraqi isolates

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Abstract

Biochemical and microscopic tests (that identified the phenotypic characterization) and Genotypic detection of *Acinetobacter baumannii* is an important health care issue.

The isolated *A. baumannii* from various clinical specimens, were identified according to microbiological, biochemical and molecular tests (amplification of organism specific blaOXA-51 and VIM genes).

In a present study (85) clinical isolates from different clinical sources including (Sputum, Wounds, Burns, UTI, Blood). (70) samples were correctly identified according to Api 20 test and VITEK 2. PCR was performed (70) samples and the PCR result was (33) samples by using OXA-51 gene detection.

This study evaluated the accuracy between the VITEK 2 system, API 20 NE system and genotypic detection methods.

Enhanced cellular uptake and anti-cancer potentials of gold nanoparticles conjugated with cell penetration peptide against lung cancer cells

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Abstract
Gold nanoparticles (GNPs) are often conjugated in the biomedical field with biocompatible peptides, although the effect of biocompatible GNP peptides on cellular responses is still not clearly understood. In the current study, GNPs with / without peptide were used as model probes to investigate the cytotoxicity to the human lung cancer cell line (A457) and human normal breast epithelial cell line (HBL-100). GNPs and GNPs-RGD preparation was confirmed and characterized using UV – VIS spectrophotometer, FE-SEM, FTIR, and TEM. The anticancer effect to A457 cell line was estimated using MTT assay. Our results show that the GNP-RGD had found significant tumor targeted efficacy and decrease in proliferation of A457 cell line compared with HBL-100 which appeared normal growth. Overall, our finding suggests a potential therapeutic effect of GNPs-RGD as a novel anti-cancer drug to be further developed and offer a beneficial targeting therapy.

Keywords: GNPs; GNPs-RGD; Cytotoxicity; A457 cells; HBL-100.

Prevalence of head lice among students of some primary schools in district of Tikrit and Albu-ajil in Salah al-din province and its impact on blood picture

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Summary : The study investigated the prevalence of head lice *Pediculus humanus capitis* among the students of Al-Bashaer and albu-ajil primary school in Tikrit district and Al-Boujail for period from January to June 2018.and effect this parasite on Blood image of infected students. The results showed prevalence of parasitic infection among the students of two schools with a total percentage of 10.664%, of which 7.218% were students of Al-Bashaer School and 19.886% of Al-Boujail School students. The incidence of all types of stunting in all age groups was 10.18% And in age group 7-6 years, where the ratio was 22.2% for female students infected. The ratio of length of hair and percentage of head lice infestation and its prevalence was evident with highest percentage of long hair and 14%, and curly hair was highest percentage compared to hair follicles, where the percentage was 16.118%, 5.830%. highest percentage of infected people whose and non-primary education and those with a weak economic level. An increase in total number of white blood cells and an increase in rate of acidophil and monocytes due to head lice and comparison with control group.

Kewordes: *Pediculus humanus capitis*, primary school, total w.b.c. count, w.b.c. differential count.

Case report of a rare complication of tracheostomy tube in intensive care unit:

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Abstract
Commonly seen complications of tracheostomy include hemorrhage, obstruction, and pneumothorax. These primary complications usually become apparent quickly after the procedure. However, some complications manifest themselves at a later stage. Granular tissue, Scar formation, tracheal stenosis, ulceration, tracheoesophageal fistula and corrosion of the small arteries are not seen secondary complications in tracheostomy(1). We report an unusual case of a tracheostomy tube complication in an adult male.

Renal impairment in diabetes mellitus type2 in Iraq

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Summary

The present study was designed to investigate if there is any relation of inflammatory markers in the development and progression of renal impairment in diabetes mellitus type 2, so this study was conducted in the department of Biology, Al-Rasheed University College, comprising of n= 80 subjects known Diabetes mellitus patients with an age range 30 - 60 years and healthy controls n=80 with age range 30 - 60 years attending the national diabetes center for treatment. The study was aimed to quantitatively estimate the amount of serum urea, creatinine and IL-6 levels present in the blood, and evaluate their correlation in diabetic and non-diabetic subjects. The mean ($\pm$ S.D.) serum urea level in the control group was found to be 24.95$\pm$10.88. whereas in diabetics, it was found to be 50.75$\pm$19.69. The mean ($\pm$ S.D.) serum creatinine level in the control group was found to be 0.81$\pm$0.14 whereas in diabetics, it was found to be 1.40$\pm$0.87. The Il-6 in the control group was found to be 7.41 + 0.54 whereas in diabetes patient 10.66 + 1.16   thus, the mean levels of urea, creatinine and Il-6 was significantly higher in the diabetic subjects as compared to controls. So, the urea and creatinine and Il-6 is simple and useful biomarker which can serve as predictor tests for assessing kidney functions (nephropathy) in diabetic patients type2.

Keywords: Interleukin-6 (IL-6), urea, creatinine, ELISA, Diabetes mellitus, Biomarker, nephropathy, fasting blood glucose

The Antibacterial activity of Spirulina platensis aqueous extract and Chitosan nanoparticles on bacterial isolates from different human Sources

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ABSTRACT

This study has involved the test of antibacterial activity for Spirulina platensis aqueous extract (SPAE) and Chitosan nanoparticles (CHNPs) towards Pseudomonas aeruginosa, Klebsiella pneumoniae, Escherichia coli, Sphingomonas paucimobilis, Staphylococcus aureus, Streptococcus pneumoniae and Granulicatella adicans that isolated from different infection sources. The results were showed that 200mg/ml of SPAE showed an ability to inhibition of bacterial isolates at inhibition zone diameters IZD at 22, 20, 25, 13, 11, 26 and 11 mm. While the 100mg/ml of CHNPs was inhibited effects at 37, 29, 27, 37, 38, 41 and 36 mm respectively. The Minimum Inhibitory Concentration MIC of SPAE against P. aeruginosa, K.pneumonia, E. coli, S. pneumonia was at 50%, while S. paucimobilis, G. adicans and S. aureus were at 100%. The used of 75mg/ml of SPAE or 12.5 mg/ml from CHNPs have significant synergism inhibition effects with each 25 µg Amoxicillin, 10 µg Ciprofloxacin and 15 µg of Azithromycin against the bacterial isolates compared with the antibiotic actions alone.

The conclusion was showed that SPAE and CHNPs has inhibiton activity against the bacterial isolates and increased significantly when mixture with the antibiotics.

Keywords: Antibacterial, *Spirulina platensis,* Chitosan nanoparticles, bacterial isolates,

Expression of (CD105) And (VEGF-R3) In dermoidcyst

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Abstract

*Background :*A dermoid cyst is a type of cystic teratoma which is benign in most cases, but in rare cases, it is malignant, a squamous cell carcinoma may developed in adults, and an endodermal sinus tumor in infants and children. Recurrence have been reported. Only limited studies have adopted stromal factors such as the role of angiogenesis and lymphangiogenesis.

Aim of this study: to evaluate the mean density of vessels in dermoid cysts and investigate its possible relationship with biological behavior of these lesions.

Materials and methods: Thirty formalin fixed paraffin embedded tissue blocks dermoid cysts which were collected from laboratory archive of histopathological laboratory of Al Hussain teaching Hospital included in this study .The samples were immunohistochemically stained with monoclonal antibodies against CD105 and VEGF-R3.

Results: The mean of blood vessel density measured in all cases by CD105 immunomarker was (7.5833±2.55317). The mean of lymphatic vessel density measured in all cases by VEGF-R3 immunomarker was (4.6900±2.80152).However no significant relationship was found between CD105 expression dermoid cysts and presence or absence of daughter cyst (p=0.159), while high significant relationship was found between CD105 expression and inflamed dermoid cysts (p=0.0000). For VEGF-R3 expression statistically no significant relationship was found between dermoid cysts and presence or absence of daughter cyst (p=0.234) and presence or absence of inflammation (p=0.726).

Conclusion: the study shows that angiogenesis might be one of the mechanism that is more possible to contribute the aggressive biological behaviors in dermoid cysts.

Key Words: dermoid cysts, CD105 immunomarker, VEGF-R3 immunomarker.

Study the association between coronavirus (covid-19)and asthma in Thi-Qar province/ Iraq

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Abstract
Asthma is a syndrome characterized by attacks Shortness of breath, coughing and wheezing accompanied Air flow blockage. Respiratory viral infections are the leading causes of asthma attacks. Coronavirus (covid-19), is the most prevalent pathogen currently in society. The current study was conducted in southern IraqThi-Qarprovince during the period from April to May(2020)on 300 patients with Covid-19 (ages ranged between 10 -85 years), this study aimed to know the relationship between Covid-19 and asthma .The results of the study showed that asthma patients are not more infected with Covid-19 than others, but they suffer from severe symptoms when infected,Only 6.7% of Covid-19 patients suffering from asthmaand90% of asthma patients with Covid-19 are recovering and about10% are die.
Keywords : Asthma, Covid-19,corona virus ,recovering

Efficacy of Oral Administration of a Reliable AD3E Treatment on Vitamin D3 Deficiency in Najdi Sheep

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Abstract
This study was aimed to assess the efficacy of oral treatment of commercial product of vitamin D3 (VITOL-80 C ORAL®, Interchemie, Holland) in growing Najdi sheep suffering from musculoskeletal illness due to vitamin D3 deficiency in Basra province, Iraq. Using a Najdi sheep model bred in Iraq, here we focused on measuring the serum levels of total vitamin D3, calcium, phosphorus, parathyroid hormone (PTH), alkaline phosphatase (ALP) and alanine aminotransferase (ALT) as well as complete blood count (CBC) and clinical examinations pre and post-treatment with VITOL-80 C ORAL®. No significant changes (P > 0.05) of the vitamin D status were recorded in Najdi sheep with vitamin D3 deficiency post treatment with (VITOL-80 C ORAL®). However, a sharp (P < 0.0001) decline of the total serum vitamin D3 concentration were observed in those Najdi sheep per-administration (21.95 ± 1.82 ng/ml) and post-administration (22.29 ± 1.34 ng/ml) of vitamins therapy contrast to control healthy Najdi sheep (89.75 ± 6.84 ng/ml). An interaction between vitamin D3 status and the serum concentrations of calcium/phosphorus, PTH, ALP and ALT was observed. With vitamin D3-deficient Najdi sheep; values of CBC, and calcium/phosphorus concentrations were lower while PTH, ALP and ALT were higher than the healthy control Najdi sheep; thus, no significant changes (P > 0.05) of these values were recorded post treatment of (VITOL-80 C ORAL®). In conclusion, vitamin D3 deficiency threats the health of local Najdi sheep and has a potential role through suppressing their immunity. Oral administration of the commercial product as a source of vitamin D3 is not effective suggesting involvement of vitamin D receptors (VDR) and/or dysfunction of liver and kidneys.

Keywords: *Vitamin D3 deficiency, Najdi sheep, musculoskeletal illness, calcium/phosphorus, PTH, oral therapy*

PHYSIOLOGICAL STUDY FOR THE EFFECTS OF TRAMADOL ON THE KIDNEYS AND LIVER IN MALE LABORATORY MICE

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ABSTRACT: The current study was conducted to find out the physiological effects of tramadol on the kidneys and liver in male laboratory rats. The study period was from the beginning of November 2019 to the end of February 2020. 70 laboratory rats were used between the ages of 10-11 months and their weights ranged between 200-300 grams and distributed laboratory animals were randomly assigned to 6 groups each group of 10 laboratory animals where tramadol was injected at a dose of 8 mg/kg of body weight for 10, 20, 30, 40, 50 days, respectively, and the sixth group of tramadol was given for 30 days and then left for 10 days for hospitalization, and a group of laboratory animals was used as a control group for histological examination. Where the study showed that the examination of kidney tissue rats that were given tramadol for 10 days is a natural response to the reaction of Periodic acid–Schiff (PAS). While rats treated for 30 to 50 days with tramadol, there was a significant decrease in the pigment-responsive substances in the glomeruli of the kidneys and renal tubes, compared with the animals of the control group. Whereas, liver cells of rats that were given tramadol for 30 to 50 days showed a sharp decrease in protein content compared to liver cells of the control group. The glycogen content in the liver of rats treated with tramadol for 10 days was similar with the control group, whereas the group treated with tramadol for 30 days showed moderate glycogen depletion and this involved many hepatocytes, while treated rats for 50 showed a further depletion of glycogen compared with the control group liver cells.

Keywords: examination, tramadol, tissue, liver, kidney.

Assess the Nurses Knowledge Regarding Water Borne Diseases in Basra Hospitals

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Aims: To assess nurses' knowledge regarding water borne diseases in Basra hospitals, south of Iraq.

Methodology: One hundred thirty nurses working in many Basra hospitals have been randomly chosen from different department. Demographic variables on nurses' knowledge have been determined . A Questionnaire was consisted of ten open questions, these questions included definition type of waterborne diseases, routs of transmission, prevention and available vaccines and treatment. Data was analyzed by using SPSS statistics version 16.

Results: The results showed the majority of participants mentioned cholera as a waterborne disease. Nurses answers showed good knowledge regarding transmission methods of waterborne diseases. On the other hand, the results showed the majority nurse have deficit knowledge about vaccines and treatment of waterborne diseases.

Conclusions:
Based on our results the nurses need a training program about water borne diseases.

Key words: Assiss, Knowledge, Nursing, Water Borne Diseases, Basra Hospitals

Investigation and Molecular Detection of Salmonella Typhi isolated from Patients Undergoing to Gallbladder Cholecystectomy in Thi-Qar Province /Iraq

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Abstract

A total of (200) Gallbladder tissue specimens from Patients Undergoing to Cholecystectomy who suffering from gall bladder diseases(Cholecystitis ,Gallstones and Cancer) were collected and diagnosed in AL-Hussein teaching Hospital and Noor Al- Hussein and Ibn-Al- Baitar laboratories) in Thi-Qar Province /Iraq during the period from December 2019 to July 2020 from both sexes and different age. According to the age the rate; age 43 - 70 years 46% is more susceptible for gall bladder diseases and According to the gender female is more susceptible than male for gall bladder diseases and were (66 %). The identification of *Salmonella* Typhi isolates were depended on colonial morphology and biochemical tests as a primary identification and The final identification was performed with API20 system ,the automated VITEK-2 compact system and PCR technique, twenty six (13%)   clinical isolates of *Salmonella* Typhi were isolated and the age the rate of Patients suffering from gall bladder diseases and infected   with *Salmonella* Typhi; age (43 - 70 years) (50%) while this study appeared female is more susceptible than male for gall bladder diseases and infected   with *Salmonella* Typhi and were (65.4%). All the 26 isolates of *Salmonella* Typhi were screened for their antibiotic resistance against 16 antibiotics of different classes using the   (Vitek2). The results showed that all isolates were sensitive to the Tigraracycline and levofloxacin and whereas all isolates were resistances to Ampicillin and Cefazolin; the most prevalent   pattern   included   resistance   to   Gentamycin ,Amikacin, pipracillin/tazobactam   and Cefoxitin (88,46% 84.6% ,80.7% and 80,7% respectively) Furthermore, many isolates were resistant to cefipime ,ceftriaxone , ceftazidime ,trimethoprim-sulphamethoxazole and Nitrofurantion (65.38%

,61.5% ,57.69% ,42.3% and 23% respectively), the resistances to Imipenem were 19.2% of isolates while only 15.38% of isolates were resistances to ertapenem, 30.7% and 23% of isolates were intermedait to Nitrofurantion and Ciprofloxacin respectively.The percentage of multidrug-resistant (MDR) bacteria was high more than (90%). All isolates of *Salmonella* Typhi had the ability to produce Vi antigen, which play a major role in their pathogenicity among gallbladder chronic infection.

Key words: Gallbladder diseases, *Salmonella* Typhi, VITEK-2 compact system, *via B* gene

Study of histological variants and some blood parameters resulting from infection with scabies parasites Sarcoptes scabiei

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Abstract:

The research aimed to study the effect of alcoholic extract of Eucalyptus plant leaves *Eucalyptus camaldulensis*in treating scabies caused by the parasite scabies mites *Sarcoptes scabies* by using the concentration 50 mg / l.

The research aimed to study histopathological changes. It was noted in the affected skin the appearance of hyperkeratosis and the clarity of the spinal area in addition to the emergence of a small number of acid cells as well as congestion of blood vessels in the subcutaneous area. The study also targeted the effect of scabies infection and the treatment used in some physiological blood parameters. It was observed that the levels of plasma cell size PCV, blood hemoglobin Hb and the number of RBCs Rb were lower than normal and for both sexes, and that all of these values were within the permissible limits.

Histomorphometric evaluation of the effects of local application of red clover oil (Trifolium pratense) on bone healing in rats

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Abstract:

Objective:Red clover oil (Trifolium pratense) that have isoflavones bunches which estrogen-like exercises and may establish an option in contrast to hormone substitution treatment. The present examination researched the impacts of Red clover oil on bone healing in rats by histomorphometrical study

Methods: Intra bony defect was done in right femur of thirty six males healthy albino rats.Then these rats were randomly divided into three groups (12 rats for each)one control and 2 experimental group. For control, the bony defect left for normal healing, experimental (S)group the defect treated with hemostatic absorbable gelatin sponge,and for experimental (RS)group the bony defect treated with 0.2 ml red clover oil and covered by haemostatic absorbable gelatin sponge. Six rats from each group were sacrificed at 2 and 4 weeks intervals. Histolomorphometric analysis was performed on H&E bone section of all the studied groups which include counting of bone cells (osteoblasts, osteocytes and osteoclasts) ,trabecular number, trabecular area and bone marrow space area

Results: Histomorphometrical results for bone cells revealed that combination group stimulated large number of osteoblasts and osteocytes than in sponge and control group. Number of new bone trabeculae, trabecular area and bone marrow space area showed high mean value in combination groups than others. Highly significant group difference was observed in all histomorphometric parameters in all duration.

Conclusion: Red clover oil stimulated large number of osteoblasts and osteoclasts that indicate increase bone remodeling especially at 2 weeks interval when compared with sponge and control group.

Key words: Histomorphometric, Red clover, Isoflavones, Bone healing,

Association between vitamin D receptor gene polymorphism with Coronary Heart Disease (CHD) in Baghdad province /Iraq

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Abstract: Current study targeted 80 patients have Coronary Heart Disease (CHD) Their ages range from 50 to 80 years, They were diagnosed in Ibn Al-Nafees Teaching Hospital consultant by doctor's consultants in the specialty of cardiology in Baghdad governorate from period November 2018 – April 2019**.** The percentage of males with CHD was 70% compared with females was 30% from total patients. The result of vitamin D3 level for 80 patients showed about 15% of them have Severe Deficiency of D3 by mean level 7.6 ng/ml while 50% had vitamin D deficiency at a concentration rate of 14.2 ng/ml, the mild – Moderate Deficiency (Insufficient) category were appear by 25% at concentration rate of 23 ng/ml while the percentage of optimal level (Sufficient) of D3 in patients have autism were 10% by at concentration rate of 32.6 ng/ml. The results of Vitamin D receptor mutation by sequence of nitrogen bases for 10 CHD patients who suffer from a severe deficiency of vitamin D level and two-sample healthy control. The results of the showed no mutations in 8 samples in addition to two control samples while one patient (A1) was recorded 10 substitution mutations divided to 8 Transition in location 475, 395, 292, 287, 249, 211, 206, 179 and 2 Transvertion in location 314, 259, two mutations occurred within Intron and six mutation considered nonsense mutation and two missense mutation in location 314   Nucleotide G>T Nucleotide change CTA>ATA Amino acid change Leucine> Isoleucine and location 249 Nucleotide G>A Nucleotide change ACG>ATG Amino acid change Threonine> Methionine while patient (A2) was recorded 6 substitution mutations divided to 5 Transition in location 475, 292, 157, 154, 138, and 1 Transvertion in location 492. The effect of mutations, five mutations occurred within Intron and one mutation considered nonsense mutation location 292 Nucleotide G>A Nucleotide .

Key word: VDR, CHD, vitamin D, Baghdad.

The effect of Giardia lamblia parasite on some immunoassays and interleukin-10, nitric oxide NO, and sodium ion.

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Abstract
This study was conducted for the period from November 2019 to February 2020 and it included a total of (40) patients Giardia lamblia parasite for auditors and sleepers in Samarra General Hospital and of auditors of some private laboratories who Suffer from diarrhea as most cases suffer from fatty diarrhea with abdominal pain, they were 5 to 2 2 years old. It was revealed that the ratio of interstitial interleukin 10 in patients and its relationship to infection with the parasite , its effect on white blood cells and its relationship to nitric oxide NO and   sodium.
This study found a significant decrease in the level of ($p<0.05$) in the level of interleukin 10 in the infected patients with parasite, as it reached 1.65 (pg / ml) compared to the control group 3.3 (pg / ml), and a significant level ($P <0.05$) in lymphocytic leukemia in patients with parasite as it reached 32.0297 x 10^3 A mm^3 cell compared to the control group 30.8125 cells per mm^3. But the sodium ion was not significantly affected as it reached the focus 192.794 was in patients compared to the control group (focus 129.04), whereas there was an increase in the concentration of the NO level compared to the control group which increased by (0.78, 1.73) respectively.
Key word: Giardia lamblia, interleukin-10, nitric oxide NO, sodium ion.

Tramadol Impact on Central and Peripheral Neurotransmitters and Its Toxic Effect on Brain Regions

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Key words: Tramadol, Acetylcholine, Noradrenalin, lymphoid organ, and brain

Abstract:

The aim of this work is studying tramadol impacts, within the safe dose ($>$400mg/65kg body weight), on neurotransmitters concentrations in the brain and spleen as lymphoid organ compared to the kidney as a non-lymphoid organ and its toxic effect on defined brain regions. The type of mice were used in this work is male Balb/c mice. These mice were divided into adult and young groups. Every age group was divided into three subgroups (n=8 mice); H group consumed 40mg TM/kg daily, D group consumed 20mg TM/kg daily, and control group (C) consumed only water *ad libtum*. The mice were sacrificed after one month. The brain, spleen and kidney were collected and homogenized to measuring levels of noradrenaline (NE) and acetylcholine (ACH). The histopathological changes were detected only in the cerebellum sections of mice consumed tramadol which showed a decreased number of Purkinje cells and loss of their distinctive shape. While there were no differences in NE level in the kidney, significantly higher NE levels in the brain and spleen of the young and adult mice consumed TM were detected. ACH levels increase significantly in the brain, spleen, and kidney of the young and adult mice consumed TM. All these changes were more severe in the mice consumed high TM concentration. As a conclusion, tramadol consumption has very dangerous impacts on the central and peripheral nervous systems. In addition to its histological effects, it could cause hyperactivity of the parasympathetic system, which could result in a very dangerous impact on all body organs, and hyperactivity of sympathetic nerve system, which could result in many dangerous impacts of our immune system. These impacts happened also when tramadol dose not exceeded than 400mg/daily and increase with an elevation of tramadol dosage.

Intensive Care Admission Rate Due To COVID-2109

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Abstract:

Many new research has been published in the last few months regarding a novel virus, called Coronavirus-2109 or COVID-2019 that infected a diverse number of people within different countries in a short time, No definite antiviral drugs have been formed to be active against coronavirus. Patients who attacked by COVID-19 are in danger of creating respiratory failure, a fatal sequel of this infection that necessitating admission to the critical care unit (CCU). The danger of respiratory failure requiring ICU support in such patients is considerable, thus intensivists (ICU provider) and anesthesiologists must be ready for newcomer and sustained care for them **Method:** We performed a narrative review via searching in three databases PubMed, Google Scholar and Embase for all studies that mentioned all intensive care admission rates for who infected with coronavirus 2019, manual searching also completed. All the selected reviews were limited to the English language and date also. **Result:** Five researches referred to the rate of ICU admission 9.3% of all cases. Male patients were more compared to females (59% to 41%), median age range was (40-56) years, co-existing disease-associated cases range from 23.7%-51%, ICU admission rate range from 5%-32%. A half number of patients received oxygen therapy between 41.3%-76.81%, 6.7% of cases were under non- invasive ventilation with range from 4.9%-24% and just 3.6% of patients received invasive ventilation with range from 3.3%-12.32%. Finally, the mortality rate was 2.6%. **Conclusion:** The novel virus COVID-19 has shown to more likely affect older male with underlying conditions such as hypertension, diabetes, and others, a point that could expose them to fatal respiratory symptoms, including respiratory failure. So a quite enough of patients might need oxygen support and ICU admission.

Keywords: Coronavirus-2019, COVID-19, ICU admission, oxygen support, mechanical ventilation and mortality rate.

Regression Analysis for The Public Adherence to COVID-19 Preventive Protocol

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Abstract

This research was devoted to a test of the relationship between knowledge about the disease COVID -19 and the personal preventive measures by   Pearson correlation and regression analysis. Data collection was carried out through a questionnaire distributed in Basra governorate and the number of participants was 1000 individuals .Cronbach Alpha coefficient to ensure the reliability of the was calculated and its value (0.735) indicates the reliability of the research tools . The demographic data and responses of the participants were statistically described and the null hypothesis was tested (there is no effect of knowledge about COVID-19 on people's commitment with preventive protocol) using the spss program. The Pearson correlation coefficient was found to be 0.6 indicating positive correlation between the test variables. Regression analysis showed that the dependent variable (Y_{i3} : Avoid touching the face , nose and eye with unclean hands or after touching surfaces and objects .) is the most affected one in the personal prevention factors by the variables listed in the disease knowledge factor.

Key words: Descriptive statistics, Pearson, health awareness, injury prevention, COVID-19.

Radiographic evaluation of interdental bone loss in smoking patients in holy Kerbala city

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Summary: This study intends to evaluate the accuracy of intraoral periapical radiography in the detection and determination of interdental bone loss in a sample of smoking patients in Holy Kerbala city in Iraq. This sample included 130 patients, 120 males, and 11 females. All these patients are smoking; most of them attended the clinic complaining from periodontitis, gingival inflammation, and gum bleeding. Some of them attended the clinic for other purposes, such as root canal treatment, simple filling, tooth extraction, scaling, and polishing. All patients are examined clinically, and aided by intraoral bisecting angle technique radiography by the use of CSN x-ray machine and MYRAY xpod sensor system. The sample was divided into subgroups according to age, sex, brushing, and non-brushing patients.

The clinical reading was recorded. Statistical analysis was done used the triple contrast analysis test to study the differences according to the variables of age, sex, and brushing, in addition to the use of the program of independent sample t-test. The results found that there is a significant statistical difference between the age groups, except two groups from the age of 25-29 years and the age of 30-35 years at the level of significance (P-value = 0.05) for both horizontal and vertical bone resorptions. Also, there is a statistical significance difference to the horizontal and the vertical bone loss according to the gender was found in favor of male groups that mean the male groups are more affected than the female groups (P-value = 0.002) the brushing and the non-brushing groups show a significant statistical difference in the most of the groups except the (35-39) and (45-49) groups. That means The difference between the brushing and the non-brushing statistically not appear except for age groups (35-39) and (45-49).

Periapical radiography is an essential aid in the evaluation and determination of interdental bone loss and periodontitis and excellent assistance to the clinical diagnosis and treatment plan of periodontal diseases.

Biosorption of lead and cadmium and the potential role of Shewanella oneidensis

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Abstract

The bacterium *Shewanella oneidensis* was isolated from the soil in southern of Iraq,and identified basis on the traditional tests (morphological and biochemicaly) and development way(high equrance gene sequence using 16S rRNA gene phylogeny analysis). The results, indicated that the isolates bacterium was *Shewanella oneidensis*. For emphasis the bioremediation ability of bacteria, advance techniques has been applied, included: Fourier Transform Infrared (FTIR), X-ray diffusion analysis (XRD) and broadcast electron microscope (TEM). Biosorption using different concentration from Cd^{+2} and Pb^{+2} with different times has been used to clarify the bioremediation ability. The results of TEM indicate the presence of these metals around the cells of this bacterium with the appearance of some morphological changes. The results of FTIR, and XRD showed a different shifting on the peaks of spectra when they compare with the normal one with occur different peaks for loading bacteria with studied metals, these changes can emphasize the absorption ability of these bacteria.

Keywords: *Shewanella oneidensis* ; Biosorption; FT-IR ; XRD ; TEM

Molecular detection of genetically modified organisms in seeds from local Iraqi markets

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Summery

   91 samples were collected for both soybeans and soybean meal as well as rice cereals. Obtained during the current study period that started from December 2019 until March 2020, and samples were transferred to the Food Laboratory in the College of Veterinary Medicine University of Karbala. DNA was isolated from dry vegetable isolates (soybean and its by-products and rice cereals) for the varieties approved in the study using prepared protocol steps. When measuring the optical density (OD) of the DNA of all isolates, most purity values were found between (1.7 - 2.0). During the current study period, two molecular methods were used to investigate GM crops. The first method was the investigation using the PCR polymerase chain reaction in this method. Two primers were used, and they are commonly used in genetic modification. They are the CaMV-35S promoter and the terminator Nos terminator in the present study. The second method is detection using the douplex PCR chain. The current results showed that three genotypes out of seventeen genotypes belonging to the soybean meal were genetically modified containing the catalyst and terminator for the same sample of healthy Fead No. 1 soybean samples, Healthy Fead No. 2, and Healthy Fead soybean meal. No.3 using both the mono PCR chain reaction and the douplex PCR chain reaction. While all samples tested for rice grains using the same primers for the current study showed that they are free from genetic modification using the Conventioal polymerase chain reaction (PCR) technique.

Keywords, Feed, GM products, local markets, GMOs , PCR.

Chemistry Papers

Contents

Synthesis and Characterization of New Organotellurium (IV) Compounds Containing Carbodithioate Ligands

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Abstract

A series of organotellurium(IV) dithiocarbomate compounds have been synthesized in good yields under mild reaction conditions by reacting sodium telluromorpholine-4-carbodithioate and disodium homopiperazine-1,4-bis-carbothionate with various organotellurium(IV) compounds (*i.e.* Ar_2TeCl_2, and $Ar_2(CH_3)TeI$ where Ar = C_6H_5, 4-BrC_6H_4. 4-$CH_3C_6H_4$, and 4-$CH_3OC_6H_4$). The new complexes have been structurally characterized by analytical (CHN) and various spectral techniques, such as FT-IR, and ^1H and ^{13}C NMR. The coordination mode of the ligands and the geometry of all compounds were proposed according to their spectroscopic data.

An evaluation of Receiver Operating Curve (ROC) for ABCG5/G8 transporters serum as diagnostic test in patient with Hepatobiliary Diseases

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Abstract.

Foundation: The ATP-binding cassette (ABC) superfamily of dynamic transporters characterizes to an enormous number of practically various transmembrane proteins has been explored to be related with Hepatobiliary Diseases and serum lipid levels, To assess on the clinical convergence of ABCG5/G8 transporters serum by ROC bend as a test symptomatic test in Hepatobiliary Diseases .

Strategies: Patients with Hepatobiliary Diseases were accounted for , last conclusion was resolved dependent on clinical history and examinations, serum levels of ABCG5/G8 transporters . ROC examination was utilized to decide the perfect upper reference go cut off an incentive to advance affectability/explicitness for Hepatobiliary Diseases . The blood example assortment was documented to explore conceivable variety in consequences in through the employed day.

Result : The ROC examination produced an affectability/explicitness of 96%/100% for ABCG5, AUC= 1.000(P<0.001) and 97%/66% for ABCG8 AUC= 0.98 (P<0.001) utilizing 30 ng/mL such as the furthest reaches of typical for the serum ABCG5when contrasted and every single other patient of 146 patients. Serum levels of ABCG5/G8 were altogether higher in blood examples (P<0.05).

Conclusion: the Serum testing of ABCG5/G8 be there a straightforward, delicate, noninvasive, minimal effort option in contrast to other all the more normally utilized tests for Hepatobiliary Diseases .

Key word:- ROC , Hepatobiliary Diseases , serum ABCG5/G8 transporters

Review on analysis of interesting whitening agents in cosmetics products

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Abstract. The skin whitening as known as skin lightening or skin bleaching is the most commonly used skincare treatment that helps to achieve a lighter and healthier skin complexion by reducing the melanin concentration in the skin in the practice of using chemical products. Several chemicals are effective in skin whitening, while some of them are toxic or have problematic safety profiles. The products requiring to contain either kind of whiting agents were seen to display labeling issues. Such an elevated number of differences suggested concerns of whether such differences between stated and revealed content of whiting agents. The Analytical chemical measurements of these objects look necessary, no reliable analytical methods have been recorded to determine most of these chemicals. Just the measurement of hydroquinone and some of its ethers is treated by a method registered by the European Commission.

A study of Chemical Composition and determination of acrylamide in fried potato chips

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Abstract. This study was designed to investigate the chemical composition and estimation of acrylamide in fresh and fried potato chips for the models under study. This study was conducted at the Food Science Laboratories, college of Agriculture, Tikrit University, Iraq. After selecting the potato class used in this research, deep frying was carried out at different temperatures (100, 130, 150, 170, 180), and the time period for frying was (4) minuets..After the process of deep frying of the samples was completed, several analyzes processes were conducted to determine the causes of the formation of acrylamide and the factors affecting it. Potato samples were analyzed for the chemical composition before and after the frying process of the potato chips. The moisture content was measured by a drying oven, and the protein content was measured by Kjeldahl method , the fat content was measured by the speculate method, sugar and ash. The chemical composition of the fresh potato was found to be 76.3%, 0.2%, 2.7%, 1% and 19.8%). The results of the chemical composition of fried potato chips found that the highest humidity at 100 ° C for 4 minutes was 53.2% and the lowest moisture content was 10.12% at 180 ° C for the same period. The highest fat content was 34.04% at 180 ° C and the lowest fat content was 18.03%. The highest protein was at 130 ° C and 1.50%. The highest ash was at 180 ° C and was 3.11% for 4 minutes. As for sugars, the highest percentage was 51.79% when treated 180 ° C for the same period. As for the estimation of acrylamide in the samples of this study, acrylamide was extracted with water (because it has high water solubility) and alcohol Results showed that the formation of acrylamide in fresh potato chips was 5 mg / kg at a time of 4 minutes. As for the formation of acrylamide in fried potato chips at the same period and at different temperatures was (100, 130, 150, 170, 180 ° C), the highest ratio of acrylamide was 2416 μg / kg at 180 ° C compared to the lowest of 136 μg / Kg at 100 ° C and for the same duration of 4 minutes.

Keywords: fried potato chips , acrylamide , Chemical Compositio

Bioremediation of pollutant waters by Trichoderma harzianum using EDX and laboratory Examination

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Abstract

The results of water examinations for Al-Najaf sea by used energy dispersive x-ray and laboratory examination and it compare with river water were pH value was 5.5 , Chlorides 950 mg/l, Sulfate 834 mg/l and intractability of water was 811mg/l , for water samples from Al-Najaf sea. While were the results for the river samples of water in Al-Najaf city , it were pH value was 6.7 , Chlorides 344 mg/l, Sulfate 290 mg/l and Intractability of water was 390 mg/l . The laboratory results showed the role of *Trichoderma harzianum* in reducing the clear pollution factors in the pollutant waters after detecting it with an electron microscope .Where the results of the biological treatment by *Trichoderma harzianum* showed that there clear significant differences between the initial tests for the pollutant waters of AL-Najaf sea and the sea waters that were treated as follows : pH value was 6.4 , Chlorides 720 mg/l, Sulfate 400 mg/l and Intractability of water was 460 mg/l , for pollutant waters after treatment by *Trichoderma harzianum.*

Keywords : Bioremediation , *Trichoderma harzianum ,* energy dispersive x-ray.

Elevated of Calcium and Sodium Levels as a Result of Methamphetamine Addiction, Causes and Consequence

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Abstract. Methamphetamine (METH) is an addictive drug causes toxicity and degeneration in the brain. Several evidence have demonstrated that METH toxicity results oxidative stress that regulate an intracellular signaling cascade that leads to cell death. In this paper we studied the effect of METH on calcium levels because of its great importance on human health. Calcium, is a messenger of extracellular signals in a great variety of cells; it regulates several neuronal functions, such as neurotransmitter synthesis and release, neuronal excitability, phosphorylation. Calcium is also involved in long-term processes, like memory. As well, we highlighted sodium levels to find out the main course in nerve function and to keep body fluids in balance.

The study was conducted on eighty people divided into three groups, thirty non addicted men as a control group(G1), taking into account and excluding, cigarette smoking, age, social and cultural conditions, and chronic diseases, also thirty people addicted to methamphetamine(G2), and twenty people addicted to methamphetamine and other narcotic substances (mix)(G3), whose ages ranged between (15-45) years and the period of methamphetamine abuse ranged between (1-7) years.

Calcium levels were highly significant in addicts group ($P < 0.05$), as compared to non addicts group. as well, when dividing by age, Calcium level were higher in METH and MIX addicts group (A2) as compared to addicts group (A1) and (A3) ($P > 0.05$). Also, Calcium level were higher in METH and MIX addicts group (D3) as compared to addicts group (D1) and (D2) ($P > 0.05$). We have noticed Increased duration of abuse Increases calcium levels. In addition to, Sodium levels were highly significant in addicts group ($P < 0.05$), as compared to non addicts group.

During the study, it was found that age had an effect on sodium levels, Sodium level were higher in METH addicts group (A1) as compared to addicts group (A2) and (A3) ($P > 0.05$). While, Sodium level were higher in MIX addicts group (A2) as compared to addicts group (A1) and (A3) ($P > 0.05$). As well, Sodium level were higher in METH and MIX addicts group (D2) as compared to addicts group (D1) and (D3) ($P > 0.05$). Indeed, the difference in the duration of the abuse affects the sodium levels.

Keywords Methamphetamine. Calcium. sodium. central nervous system (CNS). Neurons

Kinetic Study of Adsorption of Malachite Green Dye on Poly Aniline-Formaldehyde/Chitosan Composite

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Abstract. Poly aniline-formaldehyde/chitosan composite (PAFC) was prepared by the in situ polymerization method. It was characterized by FTIR spectroscopy in addition to SEM, EDS and TGA techniques. The adsorption kinetics of malachite green dye (MG) on (PAFC) were studied for various initial concentrations (20, 30 and 40) mg/L at three temperatures (308, 313 and 318) K. The influence factors of adsorption; adsorbent dose, contact time, initial concentration and temperature were investigated. The kinetic studies confirmed that adsorption of MG obeyed the pseudo-second-order model and the adsorption can be controlled through external mass transfer followed by intraparticle diffusion mass transfer. A study of the temperature effect was indicated that the adsorption process was endothermic. The activation energy value for each concentration of the dye was calculated, it is observed that it decreases with increasing initial dye concentration.

Keywords: Adsorption, Kinetic, Malachite green, Poly aniline-formaldehyde, Chitosan.

The effect of hyperglycemia on osmolality in the Thi – Qar Governorate patients

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Abstract: 40 Samples were collected, from February 2019 until the April 2019. The average age for the two groups (A and B) was between 30 – 50 years old. 20 samples with diabetes (group B), 20 samples of people non- diabetes control groups (group A).

Both, the serum Sodium, Potassium, Urea and Glucose were estimated for all groups A and B respectively. The result indicated the presence of relative increase ($p<0.05$) of sodium, potassium, urea and glucose concentrations in (group B) as compare with (group A).

Finally, the results showed a relative increase ($p<0.05$) in osmolality concentration in (Group B) as compared with (Group A).

Keywords: Osmolality, hyperglycemia, Urea, Sodium, Potassium.

Preparation and Spectroanalytical Studies of Two New Azo Dyes Based on Luminol

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Abstract . This study involves the preparation of two new azo dyes from luminol with 4-hydroxycoumarin [3-(luminolazo)-4-hydroxycoumarin] (A_1) and with 2-vanillin [5-(luminolazo)-2-vanillin] (A_2). The characterization of dyes have been described by C.H.N. , H^1-NMR , TGA , DTG , I.R. and visible spectroscopic techniques . The electronic spectra of these azo dyes were studied in term of acid-base properties at different pH values (2 - 12) ,which includes establishing isobestic points and determination of protonation and ionization constants. The other study was the effect of solvents of different polarities on the electronic spectra .

Keywords: Azo Dye, Isobestic Points, Acid-Base Properties , Solvent Effects

Ramification role Of Urban Sewage in Al-Shatrah sub-district River Pollution

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Abstract: The practical field study was carried out at three point located along (*Al-Shatrah river*) (*A. Park – B. Hospital – C. Al- Abbasiyah).*in this district(*Shatrah)* Thi-Qar, its to invistigate the role of sewage water from the residential areas arround the river which divided the city into two sides, this river is branch from (*Al-Garraf-Canal).*

This study analyzed some (physiocochemical and biological parameters)for the sewage water and recognized the potential pollution sources at selcted three station of study.the variance major analysis parameter (*[pH]-[E.C]-[B.O.D]-[C.O.D]-[T.D.S]-[T.S.S]-[CL]-[SO$_4$]-[PO$_4$]-[NO$_3$])* moderated for samples from the field station was treated chemically during the time of study three months (*June,July,Augest 2019),*appeared varriance diffrentated in value rate among the three stations according to the pollution sources. The highly domistic wastwater from the houses,shops were the main influents factors affected water-quality. Our study can be usefully applied to help the local authortiy in order to prevent the pollution of most important life source for humans-plants-animals.

Key words : waterwaste , river pollution , water quality . Discriminant analysis.

Synthesis, Characterization and antibacterial Study of some Complexes Derivatives from 1,3,4–Thiadiazole Schiff base

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Abstract

The present study included preparing a new ligand from the thiadiazole derivatives from react between 1,2,5-dihydrazine, 1,3,4-thiadiazol with 4-Dimethyl amino benzaldehyde with a ratio of (1:2) to preparing the ligand (L_1)

Transition ions complexes (Co^{+3}, Cu^{+2}) were prepared with ligand (L_1), the ligand and its complexes were characterized using the elemental analysis (C.H.N.S), Infrared spectrum (FTIR), proton nuclear magnetic resonance spectrum (^{1}H-NMR), Mass spectroscopy, magnetic sensitivity, and molar conductivity, the practical results were exactly in line with the molecular formula and structural formulas for the compounds. The program (Hyper Chem) was used to draw ligands and their complexes and to show the distribution of electron density.

The results obtained from the study of magnetic sensitivity and molar conductivity of the prepared ligand complexes confirmed that the geometry shape of [L_1CoCl_3] is an octahedral complex, while [L_1CuCl_2] is a square planner complex. The results of molar conductivity also confirmed that the prepared cobalt complex is electrolytic, while the [L_1CuCl_2] complex is non-electrolytic.

The biological activity of the prepared ligand and its complexes were tested against two types of bacteria *Staphylococcus aureus* and *Escherichia Coli* in comparison with the standard inhibitor (Ciprofloxacin), the obtained results confirmed the biological activity of the prepared ligand was more than the standard inhibitor (Cipro) against Esche*richia coli*, also the complexes (A_1, A_2) showed higher biological activity than the standard inhibitor (Cipro) against *Escherichia coli* (Gram-negative), the ligand and its prepared complexes don't show biological activity against *Staphylococcus aureus* (Gram-positive).

Keywords: Thiadiazole, Schiff base, Biological Activity, Magnetic Sensitivity, Molar Conductivity, ^{1}H-NMR, FTIR

Scalp hair as a screening tool for detecting trace elements concentration

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Abstract

Health issues associated with critical trace elements that arise from insufficient (i.e. poor intake) and over-exposure. Measuring sensitivity is also a major problem for geneticists. Among noninvasive assays designed to quantify long-standing exposure to critical trace elements, scalp hair could be the most theoretically biological network. This analysis collects recent information relating to the safety of the scalp as a critical predictor of sensitivity to trace minerals such as cobalt, copper, boron, manganese, iron, selenium, molybdenum, silicon, zinc and vanadium. Particular consideration has been given to the exposure period through which the hair of the scalp is represented, and to the human variation of exposure rates over time in this matrix and the association between scalp hair and other essential markers, human characteristics and environmental influences. Where conventional and contemporary methods of washing and digesting scalp samples have been tested to train models for the measuring of trace metals in the scalp hair. The emergence of different approaches and new analytical procedures has made the usage of other less intrusive or noninvasive matrixes, for example hair. The existence of a chemical in these matrices indicates toxicity; however, associations between blood and the levels of non-invasive media must be established in order to insure that these quantities are associated to the total body load. The development of unique biomarkers which can be tested in this matrix would enhance non-invasive bio monitoring. Common spectral techniques such as inductively coupled plasma mass spectrometry "ICP-MS", plasma spectroscopy laser ablation "LA-ICP-MS", atomic absorption spectroscopy, etc. They have very good analytical performance, but the samples in them are subject to significant damage or are destroyed in addition to being environmentally hazardous because they require the use of hazardous chemicals and take a relatively long time. Compared to the laser induced breakdown spectroscopy "LIBS" process we find that this process has several advantages, such as the flexibility and smallness of the device and the convenience of sample preparation, as well as the ability to analyze samples from a distance, particularly in hazardous and inaccessible places.

Keywords: trace elements, scalp hair, spectral techniques,ICP-MS

Study of removal Malachite Green dye from aqueous solution using snail shell powder as low-cost adsorbent

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Abstract

This research using snail shell (Rostellaria) powder to remove (Malachite Green) dye from aqueous solution via adsorption. Experiments were conducted at 298 K to know the impact of initial concentration of Malachite Green , contact time, pH and effect of ionic strength. The optimum conditions for the adsorption of Malachite Green were realized at 0.0200 g of the adsorbent material . The maximum removal ratio was equal to 86.6585 % at 7.0000 mg/L ,10 min as adsorption time and 298 K . Equilibrium adsorption isotherms was investigated. The empirical data were analyzed by the Langmuir, Freundlich and Temkin models of adsorption at different temperature change from (298 to 338) K. The adsorption isotherm data were suitability well to Langmuir isotherm. The calculated thermodynamics information of the adsorption process ΔG^o, ΔH^o and ΔS^o refers that removal process occur via an adsorption process which features with spontaneous , exothermal and raise in the randomness of the molecules of the adsorbent dye ,the obtained isotherms information from the experiments were conform For the type (S-curve) at Giles discretion.

Keywords:- Malachite Green Dye , Study Adsorption system , Snail Shell , Isotherms , Freundlich , Langmuir and Temkin.

A Conductometric study of complexation reaction between dibenzyl-14-crown-4, with ZrO^{2+} in some binary mixed non-aqueous solvents

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Abstract

In Some binary methanol mixtures, (MeOH), 1,2 dichloroethane (DCE), acetonitrile (AN), and tetrahydrofuran (THF), with dimethylformamide (DMF) at different temperatures using the conductometric process, the reaction of macrocyclic ligand to complexation, dibenzyl-14-crown-4 (DB14C4) with ZrO^{2+} cation was examined. The conductance data show that in all solvent systems, the stoichiometry of the complex formed between (DB14C4) and ZrO^{2+} cation is 1:1 (M:L). The stability order of $(DB14C4.ZrO)^{2+}$complex in pure non-aqueous solvents was found to be: [AN], [DCE], [MeOH], [THF], [DMF]. A non-linear behaviour was observed improvements in log Kf of $(DB14C4.ZrO)^{2+}$ complex or Binary mixed solvent composition, It Was clarified as to the Interactions with solvents and even solvents in terms of the hetero-selective solving of the ecosystem affected by complexation response. The obtained results show that the stability of $(DB14C4.ZrO)^{2+}$ complex is sensitive to the composition of the mixed solvent. The values of thermodynamic parameters (ΔH°_c and ΔS°_c) for the formation of $(DB14C4.ZrO)^{2+}$complex using van't Hoff maps, the stability constant was obtained from temperature dependence. The results show that in most cases, the $(DB14C4.ZrO)^{2+}$complex is enthalpy destabilized but entropy balanced and the values and signs of thermodynamic parameters are often These are decided by nature and composition of the mixed solvents.

Keywords: Dibenzyl-14-crown-4; ZrO^{2+}cation;Mixednon-aqueous   solvents; conductometry.

FI- Spectrophotometric determination of Cu (II) ions in analytical sample Via reaction with a new reagent HPEDN

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Abstract. A new Spectrophotometric flow injection method has been established for the determination of Cu (II) ions in analytical sample . The method is based on the reaction of Cu (II) ions with 1- (4-(1- (2-hydroxyl phenyl amino) ethyl) phenyl) diazenyl) naphthalene-2- ol (HPEDN) reagent in the presence of a Buffer solution has PH equal to 9 to form a red-water-soluble stable complex, that has a maximum absorbance at 500 nm . Beer's law is obeyed in the range of 0.5-10 µg.ml-1 with a limit of detection (signal/noise=3) of 0.2213 µg.ml-1 and limit of quantification of 0.7377 µg.ml-1 and relative standard deviations of 0.65 % , The effect of chemical and physical parameters have been carefully considered and the proposed procedure was successfully applied to the determination of Cu (II) ions in analytical sample with a good precision and accuracy.

Keywords ：Flow injection , Spectrophotometric , Cu(II) copper , HPEDN.

Synthesis, Chemical Resistance and Thermal Behavior of Polyfurfural Alcohol

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Abstract

Polyfurfural alcohol (PFA) is a thermosetting polymers of furan class which has gained great importance mainly due to it being obtained from renewable resources, so in this study PFA was synthesis through polymerization of furfural alcohol in acidic medium. PFA was evaluated, and the chemical resistance of cured PFA toward some chemical compounds was study and it was observed that the cured resin was stable towards most of these chemical compounds during the test time. On the other hands heat treatments of cured resin was study at different temperatures, and the results shown that the resin has high char contents, and the FTIR study of the heat cured resin indicates some chemical change in the polymer structure

Keywords: PFA, FTIR, heat cure ,chemical properties

Nano-Parctials as corrosion inhibitors for Aluminum alloys in acidic solution at different Temperatures

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Abstract

Synthesis of sulfur nanopartical (SNPs) from mixture theosulphate sodium with Alhagi extra plant. When the change of the color after mixture theosulphate sodium with Alhagi extra plant from yellow to brown indicated the synthesis sulfur nanopartical . Atomic forces microscope (AFM) was used to study the surface topology of the formulated sulfur nanopartical was size 82.39nm. The sulfur nanopartical was used protection aluminum from corrosion in acid media , the study corrosion in different temperature ,the inhibition efficiency (%IE) of sulfur nanopartical was high in low temperature, therefore the sulfur nanopartical was active inhibition for aluminum in low temperature in acid media. The values of the thermodynamic parameters at different temperatures for Aluminum in presence sulfur nanopartical are higher than in the absence sulfur nanopartical, also the negative   value of ΔH^* for corrosion processes in absence and presence sulfur nanopartical reveal the exothermic nature of Aluminum.

 Key words: Alhagi extra plant, Aluminum alloys, corrosion Thermodynamic parameters, Thiosulfate sodium, Hydrochloric acid, sulfur nanoparticl.

Antibacterial activity of some Salen metal complexes

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Abstract:

This article primarily designed to determine antibiotic features of new species of Schiff base metal complexes $[(MCl_2)_2(Salen)]$ {M = Co (**1**), Ni (**2**), Cu (**3**), Sn (**4**), Ba (**5**), Salen = 1,2-Bis(salicylidenamino)ethane. Five binuclear complexes were synthesised by direct reaction of the corresponding metal chloride ($CoCl_2$, $NiCl_2$, $CuCl_2$, $SnCl_2$, and $BaCl_2$) with the Schiff base ligand. Obtained Salen metal complexes characterised by, FT-IR and ^{1}H-NMR, and mass spectra, spectra studies suggests that Schiff base ligand behaves as dimetalic N bidentate at metal centres. Also, these Salen complexes were tested for antibacterial activity using the Broth dilution method against two strains of gram negative bacteria (*E coli G-* and *Klebsialla G-*).

Spectrophotometric determination of sulphacetamide sodium via diazotization and coupling reaction

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ABSTRACT

A simple spectrophotometric method has been suggested for the assay of sulphacetamide sodium(SAAMS) through diazotization and   coupling. The method include the reaction of SAAMS with sodium nitrite in acidic medium of hydrochloric acid to produce the corresponding diazonium salt-SAAMS(D-SAAMS),   which   is   coupled   with   2,4-dihydroxybenzophenone(2,4-DHBP) in presence of sodium hydroxide to produce orange azo dye, water-soluble and stable which shows maximum absorbance at 497.5 nm. . The absorbance was found to increase linearly with the increasing amounts of SAAMS in the solution from 10 to 250 µg in 10 ml (1-25 µg.ml^{-1}) . Two important factors were calculated to show the sensitivity of the method: molar absorptivity and Sandell$\dot{}$s sensitivity index, have the values 2.27×10^4l.mol^{-1}.cm^{-1} and of 0.011198 µg.cm^{-2} respectively. Both values demonstrated good sensitivity to the proposed method . SAAMS has been estimated successfully in eyes drops .

Keywords: Sulphacetamide 2,4-Dihydroxybenzophenone **;** Spectrophotometric ; sodium; Diazotization; coupling.

Synthesis and Identification of Some IminoFlavone derivatives with Evaluating of Their anti-oxidant activity

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Abstract
This work deals with the preparation of high yield iminoflavone compounds by simple through three parts: the first part of this study involves the preparation of (2,4-dihydroxychalcone) by the reaction of 2,4-dihydroxy acetophenone to condensation with aryl aldehyde by used of sodium hydroxide catalysts. The second part of this study includes the preparation of (minochalcone) with p-hydroxy aniline through the condensation reaction of 2,4-dihydroxy chalcone using the catalysts H_2SO_4. The three part includes the preparation of (minochalcone) from substituted 2,4-diydroxyl iminochalcone in DMSO and in the presence of iodine .T LC to control the chemical reaction and to characterize the new derivatives using FT-IR, H1-NMR techniques. These synthesized compounds had also been assessed by (DPPH) method, the compounds (C1-C15) evaluated for their antioxidant activity, the compound C3 is strong antioxidant activity (IC50= 18.07μg/mL comparable to that of the well known (ascorbic acid) (IC50=31.95 μg/mL) used.
Key wards : iminochalcone, 2,4-dihydroxy chalcone , aniline.

The effect of serum cortisol on the prediabetes stage under normal and stress state.

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Abstract

Introduction Prediabetes is a disorder described as having above normal blood glucose levels but below the specified diabetes threshold. It is considered a dangerous condition, with a high likelihood of developing diabetes, Stress appears to be an significant consideration for the risk of prediabetes, Cortisol is a glucocorticoid that is the product of a long and complex endocrine reaction chain resulting from stress Is formed by the zone fasciculate of the adrenal cortex in the adrenal gland in many animals. It is formed in lesser amounts in other tissues. **Material and method** case study was conducted during the period from October 2019 to January 2020, It consisted of 60 men; 30 were are prediabetes subject (27 persons under normal state ,7 persons under stress state) and 30 healthy men. **Result** serum cortisol significant in normal and stress state with differences mean in both conition. **Conclusion** the level of serum cortisol in prediabetes subject supports the hypothesis that cortisol will effect to prediabetes but this is too early to consider serum cortisol as an influential and major cause of prediabetes.

Key words ; prediabetes, serum cortisol, stress hormone, stress with glucose level

Removal of Methyl Green Dye from simulated waste water using Hollow Fiber Ultrafiltration Membrane

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Abstract. Ultrafiltration has been favorably employed for recycling insoluble dyes and high molecular weight, some type of chemicals and water. Despite, ultrafiltration does not remove low molecular weight and soluble dyes (acid, direct, reactive, basic, etc.). The main advantages of the hollow fiber module are very high packing density and low-energy consumption. In this investigation, the performance of a Polyvinyl chloride (18 wt % PVC) hollow fiber ultrafiltration (UF) membrane for methyl green (MG) dye removal from aqueous solution was evaluated by examining the impact of varying the operation conditions (the concentration of dye and volumetric flow rate) to determine their impact on the separation processes (permeate flux and rejection coefficient) at constant pressure, temperature and at neutral pH. two configurations used: Semi-batch filtration and continuous filtration. UF was characterized by scanning electron microscopy. Besides, tests of the UF were carried out with pure water and MG aqueous solutions as feed. Results exhibited a notable influence of flow rate and feed concentration on the permeate flux and rejection, where the highest flux obtained equal to 32.7 l/hr.m^2 with the highest rejection coefficient value close to 59.46% of the membrane system.

Keywords- **:** Methyl Green, Ultrafiltration, Hollow fiber membrane, Rejection performances,

Study the Azure A dye adsorption on the surface of the Snail shell modification

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Abstract. This study was included (Snail shell modification) snail shell melamine formaldehyde polymer (SSMFP). It is an effective adsorbent to remove Azure A dye from aqueous solution. The effects of pH, contact time, ionic strength, temperature and amount of adsorbents were evaluated. The highest adsorption efficiency was recorded at **93.90%** with 5 mg/L dye according to the Beer Lambert (Dye Calibration Curve), 0.0050 g of adsorbent 10 minutes contact time and 298 K. Elimination data using Temkin, Langmuir and Freundlich models were analyzed at different temperatures ranging from 298 to 338 K, and the adsorption thermodynamic parameters were studied. Where ΔG values indicate an automatic process, ΔH indicates the exothermic property of the adsorption process and ΔS proves an increase. The adsorption surface was also studied and diagnosed by FT-IR, X-RD, AFM, and SEM technologies

Key. Adsorption, Azure A, Isotherms, Langmuir, Freundlich and Temkin, snail shell modified, FT-IR, X-RD, AFM, and SEM.

Synthesis And Molecular Docking Of Some Amic Acid Targeting Breast Cancer

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 Abstract:

In this study, we synthesized and investigated interactions between three amic acid analogs and HER2(3PP0) by using virtual screening based on molecular docking   to find potential compounds against HER2. The structures of the synthesized compounds were characterized based on a ^{1}HNMR, ^{13}CNMR, FT-IR and mass spectroscopy. The density function theory (DFT) calculation at the B3LYP method with 6-311++G(d,p) basis set are used to investigate the electronic structure and optimized geometrical structure of the mentioned compounds. Molecular docking against human epidermal growth factor receptor 2 (HER2) (PDB:3PP0) showed that compounds bind to the HER2. Binding involves hydrogen bonding for each compounds. The results revealed that the newly designed amic acid derivatives exhibited significant inhibition with HER2 exhibit anti breast cancer activity.

Keywords: Molecular docking; human epidermal growth factor receptor 2 (HER2); amic acid; Breast cancer

Synthesis, Charactrization of Mn^{2+}, Fe^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+}, Zn^{2+} and Cd^{2+} Complex Salts with Quinolinium and Isoquinolinium Halides Derivative Salts

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Abstract: The organic salts of type [S][Br](S = quinolinium-N-ethyl bromide and 3-methyl-N-benzyl bromide) were prepared by N-alkylation in acetonitrile solution. The series of new complex salts of type $[S]_2[MCl_2Br_2]$ were synthesized by a slow addition of ethanolic solution of metal ions Mn^{2+}, Fe^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+}, Zn^{2+} and Cd^{2+} to a solution of organic salts. Followed by reflux for 3 hr, then the solid product was isolated by filtration, washed and dried. These complex salts have been characterized by elemental analysis, IR, UV-vis.-spectroscopy, magnetic susceptibility and molar conductivity.

Keywords: Ionic liquids, Complex salts, Ionic complex, Quinolinium halides Salts, Green chemistry.

Adsorption Optimization of Congo Red Dye onto Electrospun Nanofibers of Polyacrylonitrile functionalized with Fe$_3$O$_4$ Nanoparticles

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Abstract

Ferric oxide nanoparticles Fe$_3$O$_4$NPs have been prepared by the coprecipitation method, which were used to functionalize the surface of electrospun nanofibers of polyacrylonitrile to increase their effectiveness in adsorption of Congo red (CR) dye from their aqueous solutions. The effect factors of adsorption were systematically investigated such as adsorbent mass, initial concentration, contact time, temperature, ionic strength and pH. The maximum adsorbed amount of the dye was at 0.003g of adsorbent. The adsorption of dye increased with increasing initial dye concentration and the system reaches to the equilibrium state at 150 min. The adsorbed dye capacity decreases with increasing temperature which indicates to the exothermic nature of adsorption system. The results referred that the adsorption capacity increases with increasing ionic strength and it was in natural medium has a greatest value. So, the desorption process was examined to demonstrate the possibility of recycling of the adsorbent surface. The desorbed dye from the studied adsorbent surface in basic solution was better than acidic solution.

Keywords: Adsorption, Congo red, Nanofibers, Electrospining, Polyacrylonitrile, Ferric oxide nanoparticles, Desorption.

The relation between Fibroblast Growth Factor 21 and Oxidative Stress in diabetic

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Abstract: Fibroblast Growth Factor 21(FGF21) has a key role in glucose and lipid metabolism and energy balance, as well as regulator of the Oxidative stress cell response. The research included a study of oxidative stress in healthy and diabetic also the relation between (FGF21) hormone and Oxidative Stress.

The results showed increase FGF21 level in diabetes type II (DMT2) group as compare with its level with healthy control group, also significantly increase the level of fasting glucose, Triglycerides, Total cholesterol, Malondialdehyde (MDA) and the activity of Lactoperoxidase and peroxidase while there was a significantly decrease the activity of Aryl esterase .

Also the results elucidated FGF21 level has positive correlation with peroxidase, loctoperoxidase enzymes and malondialdehyde, Triglycerides, Glucose, Total cholesterol, while FGF21 level shows significantly negative correlation with the activity of aryl esterase enzyme.

It was concluded this study show the Serum FGF21 level was significantly correlated with clinical parameter and oxidative stress in diabetic type II and the identification of relation between FGF21 level and oxidative stress through the Complications that occur in diabetic patients.

The relationships between acetylcholinesterase activity and some ions (calcium , sodium) in patients diabetic mellitus with neuropathy in Babylon province .

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Abstract

The study was designed to understand the relationship between calcium ion, Enzyme AChE activity and Sodium ion in patients type 2 diabetes mellitus with neuropathy. A total of (167) Pearson (90 meal , 77 female) ,from (113) patients suffering from type 2 diabetes mellitus (61 male, and 52 female) aged between 50 to 60 years . All have a history of disease of more than one year. The samples were obtained from Al-Marjan hospital in Hilla city,Iraq. The diabetic patients were diagnosed on the basis of WHO criteria. The study included three groups:
Group one: 68patients (39 males, 29 females) with type 2 diabetes mellitus with Neuropathy .
Group two: 45 patients (22males, 23 females) with type 2 diabetes mellitus .
 Group three: 54 (29 males, and 25 females) apparently healthy subjects were chosen as healthy controls, they were non smoker, alcohols, and did not have any history of chronic diseases.
In this study a statistically significant decrease is found in the activity of AChE (mU/ml) in type 2 diabetic patients with neuropathy as compared with other groups (type 2 diabetic patients without neuropathy and healthy). The mean of acetylcholine esterase activity are 1444.53 ± 136.69 in control group ,1466.22 ± 157.77 in type 2 diabetic patients without neuropathy and 911.45 ± 118.49 type 2 diabetic patients with neuropathy . There is highly significant p-value ≤ 0.001. The mean serum Ca ion concentration (mmol/l) according to study groups (control ,DM without neuropathy and DM with neuropathy) are 2.17 ± 0.14,2.18 ± 0.18 and 2.24 ± 0.19 respectively.
The mean serum Na ion concentration is nearly the same in diabetic patients(with and without neuropathy),the mean was 141.59 ± 5.41 and 141.69 ± 5.05 respectively, while in control group was 144.12 ± 5.52. The correlation between acetylcholine esterase activity (mU/ml) and Ca ion concentration (mmol/l) , and the correlation between acetylcholine esterase activity and Na ion concentration (mEq/l) in diabetic patients with neuropathy there are no significant correlation, p value = 0.408, r =0.115 , p value = 0.248, r =0.16 respectively. The correlation between Na ion concentration (mEq/l) and Ca ion concentration (mmol/l) in diabetic patients with neuropathy, there is non significant correlation ,p value = 0.158, r =0.195.

Spectrophotometric study for the determination of trace amount of an important medication used in the cardiovascular diseases

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Abstract:

In this work, a simple, fast, inexpensive and an accurate two methods was suggested for the spectrophotometric estimation of medication used for cardiovascular diseases such as atenolol. The first method was depend on oxidizing-reducing process which was happened between that's medication and an excess quantity of chromium as an oxidizing agent in acidic medium of 2N sulphuric acid. The residual chromium was then reacted with 1,5-diphenylcarbazide to form a reddish-violet soluble complex measured at 543 nm. while the second method depends on charge transfer reaction between atenolol and alizarin reagent to produce a wine-red water soluble and very stable product measured at 523 nm. Beer's low was obeyed from 1.2 to 40 ppm and 2 to 30 ppm for first and second method respectively. While the sensitivity of the present work was measured using molar absorptivity 0.4661×10^4 and 0.8656×10^4 $\mu g.mol^{-1}.cm^{-1}$ of first and second method respectively. Sandell's sensitivity was 0.0571 $\mu g.cm^{-2}$ of first method and 0.0307 $\mu g.cm^{-2}$ for second method. This method was successfully applied to determine atenolol in pharmaceutical preparation.

Keywords: Atenolol**,** Chromium (VI), Alizarine, 1,5-diphenylcarbazide, Pharmaceutical preparation.

Kinetic Study of Acetyle CoA Carboxylase-1purified From Serum of Premenopausal Breast Cancer Women

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Abstract

Acetyle CoA Carboxylase-1 was purified from sera of premenopausal women with breast cancer(before Mastectomy or treatment) by Gel Filtration using Sephadex G-100 and by Ion Exchange using DEAE-Cellulose A-50, also the molecular weight was estimated by the Acrylamide Electrophoresis in the absence of denaturing elements . The result showed   that a single band was obtained at 220KD by Gel Filtering while Ion Exchange showed one band at 200KD. The optimum temperature of purified Acetyle CoA Carboxylase-1 was 40 ℃ , optimal pH at 7.5 and the optimum substrate concentration at 1.8mM. Michaelis-Menten constant (km) was 0.37Mm and Velocity Maximum (Vmax) was 25mM.min^{-1} The Activation energy(Ea) was 28 KJ/mol.

keywords: Breast Cancer , Acetyl CoA Carboxylase, activity ,purification

Preparation and Characterization of a three-component hydrogel composite and study of kinetic and thermodynamic applications of adsorption of some positive and negative dyes from their aqueous solutions

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Abstract. The composite hydrogels (AAC-co-AM)-g-MCC based on microcrystalline cellulose (MCC) and poly(acrylic acid-co-acrylamide) were synthesized by free radical polymerization in an aqueous suspension of (MCC) which use as initiator for the reaction, the structure and surfaces of hydrogels was characterized and analyzed with (FTIR), Xray diffraction spectroscopy (XRD), (FE-SEM) and thermogravimetric analysis (TGA).

The adsorption mechanisms understand the dyes on surface of composite by thermodynamic Study of adsorption process Which include measuring the Enthalpy and Entropy and Gibbs energy, In addition, the dyes adsorption process accorded with pseudo-second-order rate equation, It also showed that adsorption isotherm of the composite Hydrogel is govern by Langmuir and Friendlish equations, The adsorption of dyes is a Physical adsorption, Based on structure analysis and adsorption kinetics of composite, the adsorption process was controlled by the ion-exchange mechanism.

Keyword: Microcrystalline cellulose, Dyes, Adsorption isotherm, Adsorption kinetics Adsorption thermodynamic.

Nano metal-complexes of theophylline derivative: synthesis, characterization, molecular structure studies, and antibacterial activity

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Abstract. The new divalent nano metal-complexes of Zn(II), Mn(II), and Fe(II) with new ligand derivate from theophylline were synthesis by ultrasonic sonication method. This method was applied to produce smaller, narrow distributed nanoparticles and without any aggregations. The nanocomplexes and new ligand (L) were diagnosed by different Physico-chemical studies as Analysis of elements (C.H.N), Measuring conductivity, FT-IR spectra, ^{1}H NMR spectra, UV-Vis spectra, flame atomic absorption (FAA), and their microbial activities. The spectroscopic data of the nanocomplexes suggest their 2:1 (L: M) complex structures of Mn(II), Fe(II), and 1:1 (L: M) complex structure of Zn(II). Also, the spectroscopic studies suggested the octahedral structure for Mn(II) and Fe(II) ions and tetrahedral structure for Zn(II) ion. All spectroscopic data propose that new ligand act as a bidentate ligand with its metal ions. The size and morphology of nanocomplexes measured by TEM were in range (14-18) nm. The bacterial activity was checked with the synthesized ligand and nanocomplexes. Activities show that the nano complexes are more promising than their new ligand for microbial activities.

Keywords: Nanocomplexes, new ligand, theophylline derivative, Ultrasonic Sonication, bacterial strains, TEM.

Surface Characteristics and Rose Bengal Adsorption Studies of Carbon Nanospheres Synthesized via Atmospheric Combustion of Diesel

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Abstract

In this study, the carbon nanospheres were synthesized by burning diesel and then treated with hydrogen peroxide (H_2O_2). The results showed that H_2O_2 - carbon nanospheres has a higher surface area than carbon nanospheres and therefore it was chosen as an adsorbent surface to remove the Rose Bengal dye from aqueous solutions. The prepared carbon nanospheres were examined by FTIR, XRD, SEM, AFM, TGA, Raman spectroscopy, BET and EDX. The FTIR study reveals the presence of hydroxyl and carboxyl stretching vibration and weak peaks belong to CH_3, CH_2 and C=C. Results obtained by Raman and XRD analysis are in good agreement thereby indicating the amorphous structure of the carbon nanospheres. Also, SEM images confirm the presence of soot materials as spherical and semispherical nanoparticles with diameter in the range (31-78 nm). Surface roughness calculated from AFM data provided evidence that spiky appearance on both carbon surfaces. TGA data indicate that both carbon samples are thermally unstable. BET and BJH results indicate that the treated sample possesses the highest surface area and mean pore diameter. EDX analysis indicated the presence of pure carbon nanosphere (treated sample) without any contamination. Also, the adsorptive removal of Rose Bengal on synthesized carbon nanospheres was studied. The isotherm adsorption results were found to be described fitted by the Freundlich rather than the Langmuir and Temkin models. Furthermore, the kinetics of dye adsorption were applied better by the pseudo-second-order model.

Key words: Diesel oil, Combustion, Carbon nanospheres, Adsorption, Rose Bengal

A comprehensive analytical study of water quality in Al-Khalidiya district in Anbar governorate, Iraq

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Abstract

The study includes physical, chemical and bacteriological measurements of raw and drinking water in Al-Khalidiyah district in Al-Anbar governorate at several areas which are (Al-Khalidiya Central, Al-Sadiqiya, Al-Madiq, Al-Shuhada neighborhood). The collection of samples began in February until April 2019. This study includes the conduct of physical measurements of (temperature, electrical conductivity, turbidity, suspended solids and dissolved solids) and chemical measurements of (pH and positive ions (calcium magnesium, sodium and potassium), negative ions (sulfates, chlorides, nitrates, alkalinity and total hardness) and bacteriological measurements (M\Plate count1) and (E. Coli).

The results showed that there are a variation in the values from the Iraqi and international standard limits, as there was an increase in electrical conductivity and the concentration of magnesium and sulfate. The rest of the properties did not exceed the limits of Iraqi and international standard. The results were also analyzed statistically using the SPSS statistical program. Direct and inverse correlations between the variables (water properties) were found, as well as the correlation between physical and chemical measurements of different water properties.

Keywords: drinking water, Al-Khalidiyah district, physical measurements, chemical measurements, SPSS statistical program.

Synthesis of hexenyl aryl tellurides and the catalytic activity of their platinum(II) complexes as polysiloxane-supported catalysts in hydrosilylation of olefins

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Abstract

 5-hexenyl 1-naphthyl telluride (**1**) and 5-hexenyl (1,1'-binaphthyl-2-yl) telluride (**2**) were prepared from the reaction of 1-bromonaphthalene and 2-bromobinaphthalene with di(5-hexenyl) ditelluride in presence of lithium metal. Reaction of **1** and **2** with K_2PtCl_4 afforded the platinum(II) complexes **3** and **4**, respectively in good yields. Silica-bound telluride-platinum complexes were directly synthesized from fumed silica, triethoxysilane and platinum complexes (*i.e*. **3** and **4**). The catalytic activities of polysiloxane-supported platinum complexes were examined with 1-hexene, 1-decene and 1-dodecene at different temperature. It was found that these catalysts are efficient for hydrosilylation of olefins with triethoxysilane.

Keywords: Hexenyl aryl tellurides; Platinum (II) complexes; Hydrosilylation; Supported

catalyst; Silica.

Spectrophotometric Determination of Benzocaine via Oxidation and Bleaching Colour of Rifampicin Dye

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Abstract

Benzocaine(BENZ) has been estimated by indirect spectrophotometric method. The suggested method based on oxidation of BENZ via N-bromosuccinamide (NBSA) in presence of hydrochloric acid, then the unreacted or the excess NBSA was immerse in bleaching the colour of rifampicin dye(REFPD),the absorbance of unreacted REFPD has been estimated at wavelength 476 nm (the highest absorption of REFPD) .The measured absorbance is directly proportional to the amount of BENZ in the solution. All parameters affected the oxidation of BENZ and bleaching the colour of REFPD and the optimum values have been fixed. Beer's law(linearity) of the method is in the range of 2 to 15 μg.ml^{-1}, the molar absorptivity value equal to 4.295 x10^{3} l.mol^{-1}.cm^{-1} and the Sandall's index for sensitivity is calculated and equal to 0.0384 μg.cm^{-2}.The suggested method has an application part included estimation of BENZ in its pharmaceutical formulation (sterile ear drops).

Keywords: Benzocaine, rifampicin, N-bromosuccinimide, spectroscopy, bleaching.

Removel of a Bsoprolol drug from Aqueous Solutions onto Graphene Oxide/ Carboymethyl cellulose sodium /Acryl acid polymer Composite by Adsorption

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Abstract

A polymer-based composite hydrogel was synthesized through chemical crosslinking by a free radical polymerization of acryl acid as a monomers and GO. GO /P (CMC -co- AA) was prepared. This composite hydrogel, were synthesized by using potassium persulfate as initiator and N, N – methylene bisacrylamide as cross-linker., X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), field-emission scanning electron microscopy (FE-SEM) , thermo gravimetric analysis (TGA) . Moreover, GO/P(CMC-co-AA) -structures were studied to show (BSP) adsorption from aqueous solution. The adsorption isotherms of Bisoprolol on the GO/P(CMC-co-AA) composite could be illustrated well by the Freundlich and Langmuir model. The thermodynamic factors (ΔG^{o} , ΔH^{o} and ΔS^{o}) estimated, from the temperature-dependent isotherms revealed that the adsorption reaction of Bisoprolol on the GO/P(CMC-co-AA) composite was an exothermic and spontaneous process, obtaining an increase in the thermodynamic stability of the adsorption system . Finally, the results indicated that adsorption process followed two models and demonstrated that intraparticle diffusion plays a significant role in the adsorption mechanism.

Keywords: adsorption, Graphene oxide, hydrogels, Beta Blocker, Bisoprolol.

Mechanical dry method for synthesis of cobalt metal nano particles

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Abstract:

Cobalt-chloride coordination used as simple solid state method to synthesized in the solid phase, product of magnetic cobalt nano hybride was produce, the complexes undergoes a reversible phase transition, changing color at room temperature. The structure and the morphology of the produced materials was studied using FTIR, SEM and XRD spectroscopy, magnetic susceptibility measurements was done, the need of new magnetic materials is distinct interest of researchers on the study of magnetic materials, complexes transform to nanoparticles electromagnetic Cobalt metals were successfully synthesized by dry mechano method, decomposition synthesis was successfully occur . Structure morphology and magnetic properties were studied and reported. properties are characterized by X-ray diffract metric and scanning electronic microscope, SEM

Synthesis and Reaction of 2-Acetylamino-2'-Tellurocyanato-1,1'-Binaphthyl

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Abstract.
2-Acetylamino-2'-tellurocyanato-1,1'-binaphthyl (**1**) was prepared from the reaction of potassium tellurocyanate with 2-acetylamino-[1,1'-binaphthalene]-2'-diazonium chloride. Treatment of **1** with hydrochloric acid gave bis(2-amino-1,1'-binaphthalene-2'-yl) ditelluride (**2**) in 65% yield. Reaction of **2** with phenylacetyl chloride and trimethylacetyl chloride gave bis(2-phenylacetylamino-1,1'-binaphthalene-2'-yl) ditelluride (**3**) and bis(2-trimethyl-acetylamino-1,1'-binaphthalene-2'-yl) ditelluride (**4**), respectively. (2-Acetylamino-1,1'-binaphthyl-2'-yl)tellurium tribromide (**5**) was prepared by reaction of **1** with bromine. Partial reduction of **5** gave the corresponding tellurenyl bromide (**6**) which in turn reacted with KCN to afford compound **1** in good yield. Alkaline hydrolysis of **1** or reduction of **5** and **6** with hydrazine hydrate in boiling ethanol gave bis (2-acetylamino-1,1'-binaphthalene-2'-yl) ditelluride (**7**) in good yield. All these new compounds were characterized by elemental analyses, IR, ^{1}H and ^{13}C NMR and mass spectrometry.

Keywords: *Tellurocyanate, Binaphthyl, Ditellurides, Tellurenyl bromide*.

Fabrication of a new photo-sensitized solar cell using TiO2\ZnO Nanocomposite synthesized via a modified sol-gel Technique

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Abstract

The current research synthesized was carried out using a modified sol-gel Technique for titanium dioxide (TiO2) and zinc oxide (ZnO) nanocomposite. The morphology and optical properties of the synthesized nanocomposite were examined using a transmission electron microscope (TEM) and UV-Visible spectroscopy. The structure of the synthesized nanocomposite was proved using X-ray Diffraction(XRD). The particle size of the ZnO/TiO_2 nanocomposites was found to be range between 11 to 27.37 nm. The product of TEM has proof of the inclusion in the ZnO matrix of spherical TiO_2 particles. Also found were TiO2 sections attached to the ZnO-like rod-like particles., the ZnO / TiO2 Nanocomposites had better optical absorbing properties. The nanocomposite has been used to create a new photosensitizer solar cell with the efficiency of energy conversion of approximately 4.6%, using (E)-ethyl 4- ((4-nitrobenzylidene)) aminobenzoate as organic photo-sensitized (OPS) by **(ITO/ TiO_2\ZnO nanocomposite/POS/iodine/ silver (Ag) nanofilm/ ITO).**

Keywords: solar cell, ZnO/TiO_2 nanocomposite, modified sol-gel, organic photo-sensitized.

Evaluation the protective effect of local propels against asthma in rats

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Abstract

The aim of the present study was demonstrated the effect of local propolis on some antioxidant in induced asthmatic rats,. Blood samples from forty male rats divided into (healthy(G1),asthmatic (G2),asthmatic received local propolis (G3)and healthy received local propolis(G4)were collected and used for estimate some antioxidant in serum diagnosed lung tissue changes. The results were obtained a significant decrease in the level of antioxidants in the (G2)(except nitric oxide) when compared with (G1)as well as a significant increase in the level of antioxidant (except nitric oxide) in the (G3) and (G4) when compared with (G2) and (G1), respectively .Physiological tests showed the lung changes in (G2), but these changes are diminished in (G3),. Conclusion: The results shows the ability of propolis to decrease free radicals formation and increase effectiveness of some antioxidants in induced asthmatic rats.

Keywords: Antioxidants , Anti-inflammatory ,Asthma , ,Asthmatic rat, Propolis

Study of New Derivatives of 1,3,4-Thiadiazole and Its Complexes with chromium ion (Cr^{+3})

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Abstract

The present study included preparing a new ligand from the thiadiazole derivative 2,5-dihydrazineyl-1,3,4-thiadiazol with 4-Dimethyl amino benzyaldehyde with a ratio of (1:2) to preparing the ligand (L_1)

Transition ion complexe (Cr^{+3}) were prepared with ligand (L_1) and ligand and its complexe were diagnosed using the elemental analysis (C.H.N.S), Infrared spectrum (FTIR), Proton nuclear magnetic resonance spectrum (^{1}H-NMR), Mass spectroscopy, magnetic sensitivity and molar conductivity, the practical results were exactly in line with the molecular formula and structural formulas for the compounds.The results obtained from the study of magnetic sensitivity and molar conductivity of the prepared ligand complexe confirmed that the geometry shape of $[L_1CrCl_2]Cl$ is an octahedral complex . The results of molar conductivity also confirmed that the prepared Chromium complexes is electrolytic .

The biological efficacy of the prepared ligand and its complexity were tested against two type of bacteria *Staphylococcus aureus* and *Escherichia Coli* in comparison with the standard inhibitor *(Ciprofloxacin)*, the obtained results confirmed the biological efficacy of the prepared ligand above that of the standard inhibitor *(Cipro)*, against of the bacteria *Escherichia coli*, also the complexe (X_1) showed higher biological efficacy than standard inhibitor **(Cipro)** against *Escherichia coli* (Gram negative), the ligand and its prepared complexe don't showed biological activity against *Staphylococcus aureus* .

Keywords: Thiadiazole, Biological Activity, magnetic sensitivity, molar conductivity.

Mathematics Papers

Contents

L_P , $\infty > P \geq 1$ Simultaneous Approximation

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Abstract— Many papers were introduced about the best approximation. But little introduced for simultaneous best approximation for L_p Simultaneous approximation. Here we introduce some results for L_p, p≥1, simultaneous approximation.

Keywords— Simultaneous approximation, L_p spaces.

Compatibility of Center Ideals with Center Topology

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Abstract
In this section, we will explain some concepts such as ($\mathcal{C}$-local function, $\mathcal{C}$-closure operator, $\mathcal{C}^*$-topology and compatible of center ideal space) with clarification of relationships.

Keywords: center set, center ideal, center local function and center closure operator.

Fuzzy Topological Dimensions And Its Applications

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Abstract:

The purpose of this paper is to present a formal definition of the computational fuzzy topology is shown which is based on the fuzzy ω-interior operator and fuzzy ω-closure operators. In spatial object modeling the fuzzy ω-interior, fuzzy ω-exterior, fuzzy ω-closure and fuzzy ω-boundary are computed based on computational fuzzy topology and we applied this studied and we determined the fuzzy ω-interior, fuzzy ω-exterior, fuzzy ω-closure and fuzzy ω-boundary of flood affected areas in Iraq and we obtained several properties.

Keywords: 3-Dimension fuzzy region, fuzzy ω-interior, fuzzy ω-exterior, fuzzy ω-boundary

On Hollow acts

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Abstract

In this paper, we complete an early result by R. Khosravi and M. Roueentan on the hollow act and obtained new properties and characterizations for this notion continues the account of hollow act for commutative monoids begun on 2019. This notion (hollow acts) represents a dual notion to the uniform acts which were submit by M. Roueentan and M. Sedaghatjoo on 2017. An S-act M_S is referred to as hollow act if every subact N_S of M_S is small where a subact N_S is called small (or superfluous) in M_S if for every subact H_S of M_S, $N_S \cup H_S = M_S$ implies $H_S = M_S$. Equally, we reformulate this definition in another words as follows: an S-act M_S is referred to as hollow if whenever N_1, N_2 are subacts of M_S and $N_1 \cup N_2 = M_S$ implies either $N_1 = M_S$ or $N_2 = M_S$. Conditions under which subacts are inheriting the property of the Hollow act have been examined. As well as the condition on the quotient subact to be Hollow act was studied. Other properties of the small subact differ from those properties which were early studied by the author are investigated. In the interests of simplicity, the relationship between hollow acts and cyclic act is considered. As a consequence, conditions to coincide those classes are shown. Ultimately, the notion of the Hollow act was used to study when the endomorphism monoid will be local.

Keywords: Hollow acts , small subacts , local acts , lifting acts, S-acts, Monoid, cyclic acts.

AMS Subject Classification: 20M30, 20M99, 08B30, 06F05.

Predicting International Adoption Visas in the United State

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Abstract. For Americans who wish to adopt children from other countries, international adoption visas are issued to the child for entrance into the United States. With the Laws and regulations are changing so often, the number of international adoptions fluctuating with these changes. We are interested in forecasting future visa values from prior visa value data. Our results support that it is possible to predict future international adoption visa numbers but for only a few years into the future due to the laws and regulations changing frequently.

Keywords: Adoption visas, Correlation matrix, Log-transformation, Outliers, Regression.

On some class of Bernstein – type operators which represent a generalization of standard Bernstein operators

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Abstract: The purpose of this paper is to introduce and study a new sequence of linear positive operators $\overline{\mathcal{B}}_{n,r}$ which represent a generalization of Bernstein – type operators to approximate a function belong to the space $C[0,1]$. Our goal is to study approximation properties of this sequence and study the uniformly convergence of it on some continous functions on a compact set $[0,1]$. We find a rate of this covnvergence using a modulus of continuity. Finaly we establish a formula of a Voronoviskaja- type asymptotic formula on $\overline{\mathcal{B}}_{n,r}$.

Computing the Filled Julia Set

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Abstract

The Julia set is one of the most remarkable and exciting fields of dynamic mathematics Because it contains very beautiful graphics.

Through this study we will highlight how the filled Julia set is computed. It is worth noting that there is an integrative work between computers and mathematical calculations to get great results to complete Julia Set filling process

Keywords: Filled Julia set , Orbit, Escape, Infinity.

Hausdorff Topological of Path in Graph

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Abstract:

Previous research has dealt with the topic of topological graph in several aspects and has studied the set of vertices or set of edges as a sub basis for topological space. The topic of domination has received the attention of many researchers in the recent period, because has many applications in the field of computers and networks. The main purpose of this paper is join between topological space and minimal dominating sets of a graph G, By using all minimal dominating sets (MDS) as open set of topology on $V(G)$. this paper discussed $T_2 - MDS$ (hausdorff property) of path P_n with $n \geq 4$.

Key words: Minimal dominating sets (MDS), Path P_n, $T_2 - MDS$ (Hausdorff $-MDS$) graph

Construct Polynomial of Degree n by Using Repeated Linear Interpolation

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Abstract

In this paper the fundamental concept of repeated linear interpolation and its possible applications in computer-aided geometric design, and start considering basic constructive methods for curves and surfaces. We discuss here a repeated linear interpolation method that we commonly find in computer graphics and geometric modelling. Repeated linear Interpolation means to calculate a polynomial by using several points. For a given sequence of points, this means to estimate a curve that passes through every single point. The purpose of this paper is to construct a polynomial of degree less than or equal to n, by using repeated linear Interpolation.

Keywords: *Repeated linear Interpolation ; linear Interpolation ; Lagrange linear Interpolation ; Lagrange interpolation.*

Some Approximation Properties of New Family of Baskakov- Type Operators

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Abstract

The aim of this paper is to establish a new family of Baskakov – type operators represented by summation type generalized Baskakov operators. Primarily, we study the convergence of this sequences of linear positive operators. Further we view some approximation properties which lead us to establish a Voronovskaja-type asymptotic formula for this operators. Finally, we study the rate of convergence when we show this new family preserve properties of modulus of continuity on a continuous function.

A Look at Sobolev Spaces on Graphs

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Abstract
We study the Sobolev inqualities of real functions defined on graphs, when $0 < p < 1$.
These spaces are important than that the space of continuous functions.
In this paper we define the canonical embedding and study the existence of $S_p(G)$ which
far from l_p^m when $0 < p < 1$. Also we estimate the subspace of $S_p(G)$ isomorphic to l_p^d
by Banach-Mazur distance of the corresponding dimension for $0 < p < 1$.

Keywords. Canonical embedding, l_p^d, Banach-Mazur distance, Sobolev spaces.

On Some Types of Fuzzy δ-Connected Spaces in Fuzzy Topological Space on Fuzzy Set

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Abstract : In this paper we introduced and study some types of fuzzy connected spaces like(Ω-connected space**,** α − Ω-connected space, feebly -connected space, α-connected space, þ-connected space, Sp-connected space, a-connected space) and the relationships between them and fuzzy δ-connected space in fuzzy topological space on fuzzy set. And We give counter examples if they are invalid And introduce Some theorems are included about this object.

Local Search Methods to Find Approximate Solution for The Sum of Two Criteria with Unequal Ready Times in Machine Scheduling Problem

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Abstract

   This research concentrates on the study of SA / TS which is regarded as two of the approaches of modern artificial intelligence, to solve the problems of scheduling by single machine to minimize bi _ criteria $1 / r_j / \sum_{j=1}^{n} w_j(1 - e^{-rc_j}) + T_{max}$. This problem settled up to 30000 jobs.

 Key words

Single machine scheduling**,** bi_ criteria**,** Simulated Annealing, Tabu Search.

Retractable Modules Relative To A Submodule And Some Generalizations

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Abstract:
A new generalizations of retractable modules relative to a submodule are introduced where a module $\mathcal{M}$ is called retractable module relative to a submodule N of M if for all non-zero submodule K of $\mathcal{M}$ such that contains N, there exists a non-zero homomorphism f∈Hom($\mathcal{M}$, K). Some basic properties are studied and many relationships between these classes and other related concepts are presented and studied.
Keywords: Retractable module relative to a submodule, coretractable module relative to a submodule**.

Co-Even Domination Number in Some Graphs

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Abstract

The purpose of this work is to determine the co-even domination number of various graphs, as a ladder, lollipop, butterfly, jellyfish, helm, corona, fan, and double fan graph. Before this, the important properties of the co-even dominating set are mentioned from previous work.

Keywords: Co-even dominating set , Co-even domination number, Lollipop, Butterfly, jellyfish, Helm, Ladder.

Orthogonal Basis to Solve Linear Fredholm Integral Equations via Galerkin Method

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  Abstract—in this paper, the approximate solution of linear Fredholm integral equations of the second type on a closed interval is studied. The Galerkin method enhanced with Chebyshev polynomials was used to improve the approximate solution of our study, the related linear system was solved by the Boole's numerical integrated rule. for testing the efficiency of the proposed method, the comparison with related updated methods was executed.

Keywords-Linear Fredholm integral equations of second type (LFIEST), Galerkin method, Chebyshev polynomials, Boole's Rule.

On a Smarandache Closed and Completely Filter
of a Smarandache BH-algebra

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Abstract

In this paper, the notions of a Smarandache closed filter and Smarandache completely closed filter of a Smarandache BH-Algebra are introduced Also, Some properties of these notions are studied.

.

Keywords: BCK-algebra, BH-algebra, BH-algebra, Smarandache a filter of Smarandache BH-algebra.

On Asymptotic Behavior of Solutions of Third-Order Neutral Difference Equations

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Abstract

The asymptotic behavior for all nonoscillatory solutions for nonlinear neutral difference equations of third order has been investigated in this paper. Some necessary and sufficient conditions were obtained to ensure that these solutions are convergent to zero or divergent. There are some examples which illustrate our main findings.

Keywords: nonoscillatory; neutral, convergent, difference equations;

New Class of Algebraic Fuzzy Systems Using Cubic Soft Sets with their Applications

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Abstract:

In this paper, we stratify the connotation of cubic soft sets to ρ – algebras, and introduce the new class of cubic soft algebras like $(e - CS\rho - SA)$ and $(CS\rho - SA)$. We show that the R-union of two cubic soft ρ – sualgebras might not be cubic soft ρ – sualgebra. Furthermore, we show the sufficient condition to satisfy that the R-union of two cubic soft ρ – sualgebras is cubic soft ρ – sualgebra. Moreover, some of their basic characteristics are given.

Keywords: soft sets, cubic sets, fuzzy sets, ρ – algebra, ρ – subalgebra.

A New Expanded Mixed Finite Element Method for Parabolic Integro-Differential Equations   with Nonlinear Memory

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Abstract: A new extended mixed finite element method (MFEM) is suggested for parabolic integrodifferential equations (PIDEs) with nonlinear memory. On the contrary, of the extended mixed scheme, the modern extended mixed element system refers to an asymmetric positive well known and the two gradient equation as well as the flux equation can be isolated from the scalar undefined equation. The presence and uniqueness of the semi-discrete system can be confirmed and error estimates can be achieved for semidiscrete. Fully discrete can be said to be discretization.

Keywords: Expanded mixed finite element method, semi discrete, error estimates, parabolic integrodifferential equations with nonlinear memory.

Regression Analysis for The Public Adherence to COVID-19 Preventive Protocol

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Abstract

This research was devoted to a test of the relationship between knowledge about the disease COVID -19 and the personal preventive measures by Spearman correlation and regression analysis. Data collection was carried out through a questionnaire distributed in Basra governorate and the number of participants was 1000 individuals .Cronbach Alpha coefficient to ensure the reliability of the was calculated and its value (0.735) indicates the reliability of the research tools . The demographic data and responses of the participants were statistically described and the null hypothesis was tested (there is no effect of knowledge about COVID-19 on people's commitment with preventive protocol) using the spss program. The Spearman correlation coefficient was found to be 0.6 indicating positive correlation between the test variables. Regression analysis showed that the dependent variable (Y_{i3} : Avoid touching the face , nose and eye with unclean hands or after touching surfaces and objects .) is the most affected one in the personal prevention factors by the variables listed in the disease knowledge factor.

Key words: Descriptive statistics, Spearman, health awareness, injury prevention, COVID-19.

A Modification Fractional Homotopy Analysis Method for Solving Partial Differential Equations Arising in Mathematical Physics

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Abstract: In this paper, we apply a new technique, namely fractional Sumudu homotopy analysis method (FSHAM) on fractional partial differential equations to obtain the analytical approximate solutions. The fractional derivative is described in the Caputo sense. This method is the combination of the Sumudu transform (ST) and homotopy analysis method (HAM). The method in general is easy to implement and yields good results. Illustrative examples are included to demonstrate the validity and applicability of the new technique.

Using the assumption $G(q,r,s) = e^{\int y(q)dq+\int x(r)dr+\int z(s)ds}$ for solving some kinds of linear third order P.D.Es. with homogenous terms.

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Abstract: The preset paper aims at finding the complete solution of certain types of linear partial differential equations of third order with constant coefficients that have three independent variables (q,r,s) of the general form:

$A_1 G_{qqq} + A_2 G_{qqr} + A_3 G_{qrr} + A_4 G_{rrr} + A_5 G_{qqs} + A_6 G_{qss} + A_7 G_{qrs} + A_8 G_{rrs} + A_9 G_{rss} + A_{10} G_{sss} + A_{11} G_{qq} + A_{12} G_{qr} + A_{13} G_{qs} + A_{14} G_{rr} + A_{15} G_{rs} + A_{16} G_{ss} + A_{17} G_q + A_{18} G_r + A_{19} G_s + A_{20} G = 0$

By using the assumption: $G(q,r,s) = e^{\int y(q)dq+\int x(r)dr+\int z(s)ds}$, the above equation, according to this assumption, will be transformed to the non-linear second order ordinary differential equation with three independent functions. Thus, they have the general form:

$$A_1(y'' + 3yy' + y^3) + A_2(xy' + xy^2) + A_3(yx' + yx^2) + A_4(x'' + 3xx' + x^3)$$
$$+ A_5(zy' + zy^2) + A_6(yz' + yz^2) + A_7 yxz + A_8(zx' + zx^2)$$
$$+ A_9(xz' + xz^2) + A_{10}(z'' + 3zz' + z^3) + A_{11}(y' + y^2)$$
$$+ A_{12} yx + A_{13} yz + A_{14}(x' + x^2) + A_{15} xz + A_{16}(z' + z^2)$$
$$+ A_{17} y + A_{18} x + A_{19} z + A_{20} = 0$$

Note:- _we used y instead of_ $y(q)$ _and x instead of_ $x(r)$ _also z instead_ $z(s)$.

Calculation the Determinants of matrix by Permutation Algorithm by fixing two components by Computer

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Abstract

In this paper, we will present a complementary algorithm for calculating the determinants order of n×n, (($n \geq 5$) Matrixes. This algorithm is based on the proposed ideal algorithm for permitting the fixing of two components. Programming this algorithm in Matlab as an application on permutations algorithms to finding determinants.

Keyboard:- Generated Permutation, Algorithm for Determinants, Programming Permutation, Algorithms for Permutation

Inverse Frame Domination in Graphs

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Abstract:
The generalization of the concept of inverse frame domination on graphs is the fundamental point of this work. It has been shown to present modern properties on inverse frame domination and some corresponding theorems related to delete, add edges or remove vertices. The relationship between the initial graph and a graph obtaining from the edges of the contraction was also discussed.

Key words: Domination, Frame domination, Inverse frame domination.

Mathematical subject classification: 05C69

Inverse Co-even Domination of Graphs

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Abstract

The purpose of this paper is to introduce a new inverse domination parameter in the graphs it is called inverse co-even domination number. Some properties of the theory to this definition were only touched. Also, many properties and limitations on this definition are determined. Additionally, some properties of inverse co-even domination number for some certain graphs and its complement are founded, such as regular, complete, path, cycle, wheel, complete bipartite, and star.

Mathematical subject classification: 05C69

Keywords: *Domination number, Co-even domination number, Inverse co-even domination number.*

Homogeneous and Non Homogeneous Ordinary Differential Equations with the Second Order

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Since Newton time, Differential Equations have been used to comprehend most of physical, geometrical, and vital science in addition to their participation in the study of arithmetic analysis. Furthermore, they have been used in economical and social aspects. They have been developed and got significant position in various sciences.

This paper presents for the non-homogeneous ordinary differential equations with the second order. This idea starts in chapter one which talks about the notion of those equations, their orders, in addition to the study of the linear differential equation with the first order and its solution. Whereas the second chapter studies the ordinary differential equations (homogeneous and non-homogeneous) and their solution. Each chapter is supported by solved examples that cover most of the aspects of the topic and we hope that this paper will make a good reference for those who would like to study this topic furtherly.

2-anti fuzzy domination in anti fuzzy graphs

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Abstract: The aim of this paper is to study the concepts of the concepts of 2- anti fuzzy dominating $(2 - AFD)$ set and 2- anti fuzzy domination number $(2 - AF$ domination number) of an anti-fuzzy graph (G_{AF}).We determine the 2- anti fuzzy domination number $(2 - AFD$ number $\gamma_{2AF})$ for some classes of an anti-fuzzy graphs (G_{AF}) and obtain the bounds on $(2 - AFD$ number) for the same. The relations between $(2 - AF$ domination number), anti fuzzy domination $(AF$ domination number) and vertex anti-fuzzy vertex covering number (α_0) are discussed and found some result.

Keywords: Anti fuzzy graph, AFD number, $2 - AFD$ number and anti fuzzy vertex covering number α_0.

On doubt Intuitionistic fuzzy semi d-ideal of d-algebra

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Abstract. In this paper, we over the concept of doubt intuitionistic fuzzy d-algebra and the notation of doubt intuitionistic fuzzy semi d-ideal with various important properties, also we investigate some connection with a doubt intuitionistic fuzzy d-algebra .

Keywords: intuitionistic ideal, doubt intuitionistic ideal, fuzzy set , d-algebra .

Q-Smarandache Fuzzy Implicative Ideal of Q-Smarandache BH-Algebra

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Abstract

In this paper, The notions of Q-Smarandache fuzzy implicative ideal and Q- Smarandache fuzzy sub implicative ideal of a Q-Smarandache BH-Algebra introduced, examples are given, and related properties investigated the relationships among these notions and other types of Q-Smarandache fuzzy ideal of a Q-Smarandache BH-Algebra are Studies.

Keywords: BCK-algebra, BH-algebra, BH-algebra,Q- Smarandache a filter of Smarandache BH-algebra.

A New forms of Nano (θG) closed maps in Nano Topological Spaces

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Abstract: In this paper we presented a new forms of maps called Nano-θG^1 closed, Nano-θG^2 closed, Nano-θG^3 closed and Nano-θG^4 closed in N-topological spaces and study the relationship between other current maps in N-topological spaces. A modern look of Homeomorphism named Nano- θG^1 Homeomorphism is created and some of its characteristics are debated.

Key words: Nano-θG^1 closed maps, Nano-θG^2 closed maps, Nano-θG^3 closed maps, Nano-θG^4 closed**,** Nano- θG^1 Homeomorphism

IVIG-Induced Topology From Tritopological Space On Undirected Graphs

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Abstract

The aim of this article is to associate a tritopological space with undirected graph $G = (V, E)$, i.e. three different topologies induced from the same graph or three different graphs. These tritopologies are the unique three proposed to associate topological spaces with graphs, the first which we proposed recently (*Independent Topology*) in 2020, the second is (*Incidence Topology*) proposed in 2018 and the third is proposed in 2013 (*Graphic Topology*). Then some properties of this tritopological space were investigated. Giving a fundamental step toward studying some properties of undirected graphs by their corresponding tritopological spaces is our motivation.

Keywords: Locally finite graph, undirected graphs, tritopological spaces, *Independent Topology*, *Incidence Topology*, *Graphic Topology*.

SEPARATION AXIOMS IN SOFT TRITOPOLOGICAL SPACES WITH RESPECT TO SOFT POINTS

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Abstract:

In the present paper the definitions of separation axioms in $soft$ −tritopological spaces are introduced dependent to the $soft - \delta^* - open$ set and their basic properties are investigated with respect to $soft -$ points. That is, the $ft - \delta^* - \mathrm{T}_i$; ($i = 0,1,2,3,4$) spaces and notions of $soft - \delta^* -$normal and $soft - \delta^* -$regular spaces are discussed in detail, also we introduce some theorems shows how one of the $soft -$spaces implies the others with the help of an examples it is established that the converse does not hold.

Using of Genetic Algorithm to Evaluate Reliability Allocation and Optimization of Complex Network

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Abstract

In this paper the allocation of reliability and optimization has been calculated for each component of the complex system. Use (genetic algorithm) to solve the problem of allocation and to optimize system reliability. Also discussed are the three expense functions (exponential behavior with feasibility factor model, exponential behavior model and logarithmic model). The reliability importance of each component of the system was calculated after solving the allocation problem. The aim of this paper was to compare the results of the three cost functions by using GA in terms of reliability allocation and optimization, accurate reliability, reliability importance, and then whatever is more efficient than another.

Keywords: Reliability Allocation; Reliability Optimization; Allocation, Reliability importance, Genetic algorithm.

β-sets in topological spaces and τ_{β_s} topology

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Abstract

In this paper, the authors studies new types of sets called β-sets in topological space $(X.\tau)$. We investigate and prove some topological properties and characterization of β-sets. Also, the relation between β-sets and open sets is discussed.

Keywords: b-open set, locally closed, β-sets, Extremally disconnected and β-adherent, τ_{β_s} topology .

Left Truncated of Mixture Topp-Leone and Exponential Distribution with Estimation by Maximum likelihood

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Abstract

In this research, which contains three parameters, where a truncated state was taken from the left and a probability density function was found, as well as the moment function and the survival function, using the estimation method is the maximum likelihood estimation (MLE). And draw the figure of some of the mentioned functions using the Matlab program as well as estimating the values for the parameters.

Keywords: LT-TLGE, PDF, Moment function, Survival function, estimation, MLE.

Efficient Information-Theoretic-Statistical (ITSM) Equation for Face Recognition Technique: Comparison with Statistical Technique and Information-Theoretic Technique.

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Abstract—Spontaneous recognition of human faces is a challenging problem that has install important concern from signal processing researchers in Last years. This is owing to its many uses in various fields, including security and forensic analysis. Notwithstanding this interest, face recognition is yet one of the most challenging troubles. Up to this time, no way gives a good solution to all attitudes. In this paper we present a neoteric mathematical technicality for face recognition. which we call, (ITSM), is Accredit on our lately disseminated efficient information-theoretic-statistical equation (ITSM), which Merge three mathematically balanced equations. The first one is entropic equation (EE), the second one is histogram equation (HE), and the third one is the standard statistic (SSIM). (ITSM) Tested against versus (SSIM) and (ITSSIM) beneath Gaussian noise, so we got good results even beneath a large scale of PSNR. The face recognition with (ITSM) certified on both above measures of a test image and a database images. We performed the performance evaluation with (MATLAB)using part of the Famous (AT&T)gray Image Database that made up of (49) face images, from which we chose seven person and for each one we chose seven Perspectives (poses) with different facial emotions. The Target of this paper is to present an efficient technicality for face recognition that may work in real-time milieu. Through the implementation of our information, facial recognition has been proven with a method (ITSM) Hybrid (information - theoretic-statistical) that surpasses the known statistical technicality of face recognition (SSIM) and a technicality based on information theory known as (ISSIM).

Keywords—Information-Theoretic-statistical Similarity (ITSM); Statistical Similarity (SSIM); Information-Theoretic similarity (ISSIM); face recognition Technique; Image Processing.

A Novel Method for the Analytical Solution of Partial Differential Equations Arising in Mathematical Physics

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Abstract: In this article, an efficient analytical technique, called Sumudu variational iteration method (SVIM), is used to obtain the solution of fractional partial differential equations arising in mathematical physics. The fractional derivatives are described in terms of Caputo sense. This method is the combination of the Sumudu transform (ST) and variational iteration method (VIM). The solution of the suggested technique is represented in a series form, which is convergent to the exact solution of the given problems. Furthermore, the results of the present method have shown close relations with the exact approaches of the investigated problems. Illustrative examples are discussed, showing the validity of the current method. The attractive and straightforward procedure of the present method suggests that this method can easily be extended for the solutions of other nonlinear fractional-order partial differential equations.

Keyword: Klein-Gordon equation; Sumudu transform; variational iteration method; Caputo fractional derivative.

Invariant Factors of the Tenser Product of $(\equiv^* (C_{\alpha^3}))$

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Abstract :-
This work led to find the invariant factors of the tenser product ($\equiv^* (C_{\alpha^3})$)) and prove the general formula of $\mathfrak{H}(\overset{\kappa}{\otimes} (\equiv^* (C_{\alpha^3})))$

Keywords: Cyclic group C_α , The tenser product , rational character table of cyclic group C_{α^κ}.

Types of Expansivity on Bi-Shadowing Property

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Abstract.
Let a continuous maps $f: X \to X$, $g: X \to X$ be defined on a compact metric space X. We showed that f has bi-shadowing with g is equivalent to f has backwards bi-shadowing with g and f has two-sided bi-shadowing with g when the maps f, g are onto. We used this result to go on prove that, for expansive surjective maps f, g the properties f has bi-shadowing with g, f has two-sided bi-shadowing with g, f has s-limit bi-shadowing with g and f has two-sided s-limit bi-shadowing with g are equivalent. Finally we concluded that if a continuous maps f, g are surjective. Then f has two-sided s-limit bi-shadowing with g if and only if it has L-bi-shadowing with g.

Accelerations As(MM) and Aco(MM) To Find Double Integrals Numerically

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Abstract:

The main objective of this research is to use methods of accelerating the first type of Al Tememe Acceleration, specifically triangular acceleration sine rule and triangular acceleration cosine rule which has the main error of the second level to find the continuous double integrations specified numerically with using the midpoint rule on both internal dimension t and exterior dimension z by both methods and we will code the first method with the symbol

As(MM) and the second method the symbol Aco(MM) ;we assumed that the number of divisions on the internal dimension t was equal to the number of divisions on the external dimension z ,where we got in both methods a high accuracy in the results with relatively few partial periods and a short time with the use of the Matlab 2017 program.

The Action of Hesienberg Group on Finite Dimention Manifold

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Abstract

Our goal in this paper is introduce the action of hesienberg group on finite dimention manifold M. the interrelation ship between hesienberg group and the finite dimention manifold M is an old and vast subject. To simplify this treatment we work with liealgebra defined on a finite dimention manifold M, the heisenberg group forned an action over these liealgebra on finite manifold M.

No doubt, anotion on the heisnberg group can constitute avery important situation in the a differential finite manifold M, therefore, our work presents a key role mainly in some properties and characteriztions of the action of heinberg group on finite dimention manifold M, and also we study characterization on the relation between heisnberg group and finite dimention manifold M, then we introduce an an action of heisnberg group by the tensor product of the two repersentation which are (Acolyte groups) on hom (V_2 , V_1') be the tensor product of two representations of heisberg group and construct the definition of AC-heisnberg group, also study the properties of this action.

Key words: Heisenberg group, Lie algebra, Finite dimention manifold, Representation and bilinear map.

Spectrum of prime Q-filter of Q-algebra

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Abstract

The purpose of this study is investigate the Zariski topology of an involutory Q-algebra. We investigated new concepts of a Q-algebra, prime Q-filter, some properties of prime Q-filter in an involutory Q-algebra and investigate some basic properties of these concepts. In addition, the nation of the topology spectrum of an involutuory bounded Q-algebra was investigated. Moreover, we study some topological properties of a spectrum of an involutuory bounded Q-algebra

Keywords: Q-algebra, Q-filter, prime Q-filter, Zariski topology

Reducing the time that TRM requires to solve systems of nonlinear equations

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Abstract:

The trust region method is one of the important and effective ways to solve optimization problems due to its robust and accuracy in its convergence. One of its disadvantages is that its algorithm needs much time to solve its subproblems especially in the case of the problems that have a large-scale data. In this work, a new algorithm is suggested to solve this problem specifically subspace TRM. The initial TRR will be adequate to the subproblems which can be solved with a simple subspace, it will be simpler to solve than the classic TRM. The global convergence of the new method is investigated. The numerical results indicated that the new approach is promising.

Keywords:

Trust Region Method, Unconstrained Optimization Subspace, Global Convergence.

A Developed Approach to Estimate the Reliability of Atomium Bridge

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Abstract :

In this paper special attention was focused on a system that cyclic paths and one terminal, this paper produces a new technique to evaluate the reliability system and how to make a special kind of equations to arrive to the reliability of each part of the system network.

Key word: Reliability ,nodes probability, edge probability, shortest path, cyclic path.

Comparison of Box
− Jenkins models predicting Iraqʹs population growth rate

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Abstract

The prediction of the urban population growth rate it gives estimate the expected change in the rate of growth in the future Based on socio-economic development and geography of the population, The use of time series analysis is one of the most important statistical methods used in the study and analysis of annual, monthly and daily data To prediction the values of future random phenomena based on what happened in the past which helps in making future plans for economic development. The goal of most of the statistical population studies is to provide an approximate forecast future population. In this paper, the Box-Jenkins models were compared to predict the rate of population growth in urban areas until the year (2033) based on the criterion of the mean absolute percentage error (MAPE) to choose the best prediction model.

Keyword: Box-Jenkins, Forecasting, Time series & MAPE

Using Simulation to Estimate Reliability Function for Transmuted Kumaraswamy Distribution

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Abstract

In this study, some estimation methods (moments, modification moments, least square, weighted least square, maximum likelihood) were used to compare with each other the estimation of the parameters and reliability function of Transmuted Kumaraswamy (TK) distribution by using the simulation through four experiments (E_1, E_2, E_3, E_4) including the real values of the distribution parameters and by taking different sample sizes$(n = 10,25,50,100)$. The comparison was done using the mean square error (MSE) criterion, and the results were set in special tables included research.

Keywords: Transmute Kumaraswamy Distribution, some estimation methods and mean square error.

Computer Papers

Contents

A New Adaptive Filter for Eliminating Salt and Pepper Noise

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Abstract: Salt-and-pepper noise can substantially degrade the appearance of images and make further processing difficult. This paper develops a new filter for eliminating different levels of salt-and-pepper noise efficiently without degrading important image details. The filter uses a variable window size. After identifying distorted pixels, if there is at least one or more undistorted pixels are encountered in the processing window, the updated value of the distorted pixel is calculated by the weighted mean of undistorted pixels when a window size is 3×3 and replaced by the mean value of the undistorted pixels with the highest frequency distribution when a window size is larger. This filter is applied twice in order to sufficiently remove high noise levels. The comparison results with other denoising filters indicate that the developed filter has superior or comparable denoising capability in terms of visual appearance and objective measures.

Keywords: weighted-mean; denoising capability; salt-and-pepper noise; high frequency.

A new technique for data compression

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Abstract: Data compression has become more important than ever, due to the increasing demand for internet use and the exchange of a huge amount of images, videos, audio and documents as well as the growing demand for electronic archiving by government departments that produce thousands of documents per day. In this paper, the proposed technique for document compression will be presented.The proposed technique is a lossless and completed technique it is consists of two parts the compression part and decompression part. The compression part contains of some basic stages such as: pre-processing, blocks processing, run length encoding(RLE), replace maximum values by unused values, minimize levels, delta encoding, compression of ones values, encryption. After the encryption process is complete, the outputs are stored in two separate binary files with the extension of bmp;one of them is the header file and is considered a key for the second file which contains the compressed data. This technique applied on twenty documents and compared with other methods compression such as RLE, jpeg, tiff and png. The experimental results showed that the proposed technique gives a higher compression ratio than the rest of the methods.

Keywords: Data compression, run-length encoding (RLE), delta encoding, lossless.

Numerical simulation of surface curvature effect on aerodynamic performance of different types of airfoils

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Abstract:
The development of car modification using rear wings or spoilers, underlies the research on the aerodynamic performance of airfoil. The influence of aerodynamic forces will produce a down force to the bottom of the vehicle. The present paper investigate airfoil NACA 0012, NACA 4415, GOE 528 and GOE 652 to estimate the effectiveness of airfoil shape based on different angles of attack. The numerical simulation has been done using ANSYS Fluent to obtain drag coefficient, lift coefficient and lift-to-drag ratio of all cases. In addition, the drag and down forces have been calculated with respect to airfoil geometry features. The main objective in this paper is finding the effect of airfoil surface specification as a part of airfoil geometry features. The results observe that the highest lift coefficient value was achieved by GOE 652 which was equal to CL=1.9310 at 7 degree angle while the highest lift-to-drag ratio achieved by NACA 4415 which was equal to 100.8359. The highest down force was 1906.847 N at 15 degree by GOE 652 airfoil. The results show that the airfoil GOE 652 has the most effective surface area among the four airfoils.
Keywords: aerodynamic forces, airfoil, geometry surface features

Encrypt Audio File using Speech Audio File As a key

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ABSTRACT- In this research, a new method for audio (.WAV) file encryption is proposed using a random modification with two secret key applications. The proposed method provides a highly secure audio.WAV file and efficient audio file which has very high-frequency band.the proposed system is to convert speech audio file to text form, this text creates password seed with two keys using hash function, the first key encrypted using proposed algorithm then these keys are used to encrypt the original audio (.WAV) file by using Rijndael algorithm.

Keywords- speech audio file; Encryption; Decryption; Audio; Hash function; Rijndael algorithm Speech Recognition.

Dirichlet Tessellation's technique to compress a true color image using a Lossy compression

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Abstract: In this paper, we show how to use the concept of Dirichlet Tessellations to compress, store and reconstruct an image without affecting on its dimensions and represent it with an acceptable quality, where a true color image has compressed by 60.05% with mean square error (MSE) = 9.6081 which represents the error between the restored image and the original image, and peak signal-to-noise ratio (PSNR) =38.3044 dB which represents the similarity between the restored image and the original image , using MATLAB R2017a. Dirichlet Tessellation has simply defined as dividing the space into geometric shapes by generating finite set of distinct points, each shape contains one of the distinct points and comprising that part of the space nearer to that distinct point than to any of the other points. We have used two algorithms for image compression, First algorithm selects set of distinct points distributed uniformly in an image and store their locations along with pixel values. In the second algorithm random selection of distinct points, which distributed in regions containing more details, using the edges detector algorithm to detect these details. In order to reconstruct the image, Saved distinct points placed at their corresponding locations in a new image that is formed, where two algorithms used, the first algorithm based on the concept of a growing region. It's Region -Based image segmentation method, by checking the pixels adjacent to the saved distinct points and delimiting whether the pixels should add to the regions of saved distinct points depending on the region's membership criteria such as pixel intensity. The second algorithm uses one of the Dirichlet Tessellations characteristics, Which divides an image into polygonal regions based on the distinct points that saved, Each pixel in the confined plane of saved distinct points will have the same characteristics of this point, This is done by taking each pixel in an image and calculating the minimum distance between pixel location and saved sites using the distance equation, This process repeated until each pixel assigned its value and specifying all color regions in the image.

Keyword: Dirichelt Tessellations concept, edge detection, lossly compression

Compression-based Block Truncation Coding technique to Enhance the Lifetime of the Underwater Wireless Sensor Networks

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Abstract
Minimizing the number of transmitted/received data represents a big challenge in Underwater Wireless Sensor Networks (UWSNs). Since the data sending/receiving represents the most energy consumer in the Underwater Wireless Sensor. Therefore, it is important to decrease it to save energy and improve the UWSN lifetime. This paper proposes a Compression based Block Truncation Coding (CBBTC) technique to minimize the volume of the transmitted measurements, save energy, thus improve UWSN's lifetime while maintaining the accuracy of the measurements received at the base station. The proposed approach operates inside the sensor nodes and designed to reduce data within each sensor node by compressing it, rather than transmitting the data raw to the cluster head (CH) to conserve the sensor energy. Our suggested technique is verified through experiments on actual data of UWSN and our proposed method is compared with other current approaches to show the superiority in terms of energy-saving, increasing UWSN's lifespan while the fidelity of data is kept.

Keywords— Underwater Wireless Sensor Networks (UWSNs), Data Compression, Energy-saving, Network lifetime.

Developed JPEG Algorithm Applied in Image Compression

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Abstract: JPEG is most popular image compression and encoding, this technique is widely used in many applications (images, videos and 3D animations). Meanwhile, researchers are very interested to develop this massive technique to compress images at higher compression ratios with keeping image quality as much as possible. For this reason in this paper we introduce a developed JPEG based on fast DCT and removed most of zeros and keeps their positions in a transformed block. Additionally, arithmetic coding applied rather than Huffman coding. The results showed up, the proposed developed JPEG algorithm has better image quality than traditional JPEG techniques.

Keywords: JPEG, DCT, DPCM, Reduced matrix, and Split Zero from Non-Zero values.

PRICE PREDICTION OF DIFFERENT CRYPTOCURRENCIES USING TECHNICAL TRADE INDICATORS AND MACHINE LEARNING

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Abstract

From the past two years with increasing geopolitical and economic issues, global currency values have been falling and stock markets have been having a poor run & investors losing wealth. This has led to a renewal of interest in digital currencies. Cryptocurrency one of the most prominent digital currency has found itself in spotlight with investors wanting a piece of it and business establishments accepting it as a source of payment due to its stable performance in the last few years. This research has been done on predicting cryptocurrency prices using machine learning based neural network which has a lowest the model loss over 100 epochs during training and Technical Trade Indicators (TTI) graphs depicts a real BTC value 5 to 10 times in 300-days of current fiscal year has further supported this increasing trader confidence and a shift in global cryptocurrency graph by predicted BTC values. On the same lines, we are analyzing bitcoin prices using Machine Learning and Sentiment Analysis. We also study stock market trends in order to better predict bitcoin prices quantitively. In this work we analyze the impact of global currencies like US Dollar, foreign exchanges on Bitcoin prices and whether Bitcoin has the stability to dethrone global currencies and become the single medium of transaction. This work is adequate enough to aid in predicting price and with results obtained from predicting Bitcoin prices using machine learning based neural network achieving an accuracy of 94.89% under all circumstances of technical trade indication thereby bringing down its price prediction by over 13.7% in April 2020 itself during evaluation.

Keywords: Cryptocurrency, technical trade, machine learning, neural network, prediction, bitcoin, economics.

A SURVEY OF SCALING DISTRIBUTED SYSTEM VIA MACHINE LEARNING AND AN INSIGHT ON HADOOP AND SPARK

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Abstract

This survey present and discuss distributed computing framework and distributed machine learning with evaluating the results of 10 papers on machine learning and big data. The first half discussed distributed computing framework, Hadoop and Spark. We briefly explained each structure and compared the key features between them. The second half consists of the survey in distributed machine learning. We briefly described the representative techniques as well as popular frameworks and discussed the major problem and challenges behind them used in different papers for scaling of distributed system via machine learning and big data techniques.Keywords: term, term, term

Energy improvement using Massive MIMO for soft cell in cellular communication

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Abstract

The process of energy efficiency improvement in any cellular network will require that the network design is densified to enhance higher spatial reuse while preserving the quality-of-service at the user. This study will analyze the combination of two densification techniques namely the small cell access point and the massive multiple-input-multiple-output (MIMO) base. The former is operator-deployed in the spatial soft-cell approach which is implemented after multiple transmitters which are in a system where non-coherent multi-flow beam forming is serving the users. In the study, the total power consumptions will be minimized to satisfy the QoS constraints. The technique has hidden convexity that will increase efficiency in the solution algorithms. This solution will promote exclusive assignments of users to the respective transmitters. The simulations in this research have promising results illustrating that the cumulative power usage can be significantly enhanced via the combination of the massive MIMO and small cell approaches. The results are viable for the optimal and low-complexity beam forming

Keywords: MIMO, Energy improvement, energy efficiency, soft cell, cellular network, densified topology

Face Recognition Using The Basic Components Analysis Algorithm

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ABSTRACT

Since all the things surrounding us have characteristics, therefore, of course, there are several characteristics and features of the human face that distinguish it and know it from others, making it a distinct organism with certain features that can be classified and identified on its basis. Since the detection and cutting of faces from the image is a critical problem that has gained importance in recent times, they play a major role in facial recognition systems. In this research, we present a new method for identifying faces using the Principal Component Analysis PCA algorithm, through the passage of the image in several stages, starting with the stage of obtaining the image (taking it); then, the face detection phase of the original image, and aligning the image (i.e. adjusting the face angle to the camera angle). After that, we enter the image with the stage of extracting the important basic features of the image; then, we match the required image with the available image store. The proposed algorithm was tested with several images and faces and faces without faces were successfully recognized. The proposed algorithm is characterized by a high efficiency in the detected faces. The accuracy of this algorithm is more than 95% in the detection faces. The proposed algorithm is a prerequisite for any system that uses the face as the main feature.

KEYWORDS. Image processing, Face Detection, Eigenvectors, Eigen faces, Eigenvalues, PCA.

Modified Advanced Encryption Standard algorithm for fast transmitted data protection

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Abstract
With the exponential growth of digital data exchange over the computer network in recent times, protection of information content is becoming a major concern. There are many security risks, which can easily compromise the data transmitted over the network. Cryptography plays an important role in ensuring the security of digital data transmission over these unsafe networks ,so in order to ensure secure and fast data transmitted over the network, an enhanced modification for Advanced Encryption Standard (AES) algorithm is proposed and implemented using additional key which generated using linear feedback shift register(LFSR), which provide an efficient technique to pseudo random number generation ,also rounds number are decreased . The proposed method give promised result comparing with original AES algorithm result for different data type text, image, and video.

Keyword AES Algorithm, Add around Key, Key, Modification, LFSR, random number

Implementing an Electronic Management System for Managing Graduate Students' Information in Iraqi Universities

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Abstract: E-management means an electronic system implemented to transform the administrative work from manual management to upgraded electronic-management used computer application within an institute. The electronic administration and management are concentrated on the branches of the E-Systems that reduce administrative working costs and upgrade performance achievement and overcome the problem of geographical and temporal dimensions. In another meaning, it tries to develop the administrative structure of society and the development of a working mechanism. Moreover, it overcomes the daily business problems with informatics infrastructure safe and robust and compatible with each other, through resource management and operations using communication networks. This paper focuses on providing an approach to e-governance that is currently the environment of the University of Diyala using. The proposed model is for controlling off the flow of data and protecting it. The verification list questionnaire and the data collection were then implemented from several levels of students and staff at the Faculty of Physical Education and Sport Science from the University of Diyala. The obtained results from the questionnaire showed that (54.8%) of the tested sample accepted the new e management model, the other (45.2%) does not accept this model for various reasons such as lack of computer use and lack of familiarity with electronic applications, or limited community culture.

Keywords: E-management, Examination Committee, administration, information system, Registration Unit.

An Enhanced Performance of K-Nearest Neighbor (K-NN) Classifier to Meet New Big Data Necessities

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ABSTRACT:
The rapid increase in the growth of text information over the past two decades has led to the need for the use of text classification techniques, particularly in the area of information retrieval, data mining and data management. The precise results and simplicity of the K-Nearest Neighbor Classification Algorithm (K-NN) in knowledge mining is the reason that made it one of the most important classification algorithms used in many tasks such as pattern recognition, regression, and text classification.

Through experiments and analysis of the results of the use of the traditional algorithm of the (K-NN), there are some deficiencies in their performance, especially when the data are large such as the algorithm was unable to process big data by rapid extraction with minimal storage space and generate useless samples computation and probability problems.

In this paper, we have developed an enhanced algorithm and get the best results and perform better than that in the traditional algorithm. The significant improvement in our model performance is due to the improvement by removing unnecessary computational samples in the traditional algorithm. The performance is further improved by using the lost value computational method to define results as a prelude to avoid wasting time by correcting and filtering noise, examining the database, and eliminating unwanted records. Additionally, the inverse logarithmic function was used to solve the probability problems the algorithm encounters. The experimental results showed the efficiency of the modified algorithm in reducing the sample size and speeding up the search for the required data.

Keywords: Data Mining, Classification, K-Nearest Neighbors, Noise Filtering, Missing Value, Logarithmic Function

The review of NAO robotics in Educational 2014-2020 in COVID-19 Virus (Pandemic Era): technologies, type of application, advantage, disadvantage and motivation

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Abstract

The use of robotics in education is a very important issue for disposal and galaxies in this era of the pandemic (COVID-19). Where this study examines the topic of robotics in education (RIE) by using modern and specific query methods extracted from different research sites and based on judicious scholar's standards. These sites are Web of Science, Taylor and Francis and Science Direct. After careful investigation and deep research, the following titles should be taken which are (a)Educational robots, (b)education in robots, (c) human-robot interaction, (d) Higher Education, (e) academic, (f) smart pedagogy, (j)student, and (h) tutors. The retrieved articles were filtered according to the Use of robotics in Education. A total of 98 articles were selected and examined. Finally, we examined the taxonomy of these articles of robotics in Education base on faith and guidance, according to specific criteria, into six groups, which include Faith and Guidance, Concepts, Device, Application, Manufacturing, Studies Analysis and educational. Therefore, this work will be the platform and the guide for student, researcher, educators, anyone how interest in this field. The current focus in this area is on employing papers containing NAO robots and that 17 articles.

Keywords

Education in robots, NAO robot, academic, student, smart pedagogy.

Utilizing Structured Query Language Database And Application XDK In Advanced Mobile Phones: Iraqi Police Model

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Abstract : - This Query obtains a fast response from the system which was designed to know the criminal history of people. The current problem is how to obtain the data stored in the database about criminals during the same time crime in Iraq capital Baghdad. which increases the speed of response to avoid possible risks and arrest criminals. The system is designed to inquire about the data stored in the database Structured Query Language My SQL to make the appropriate decision. This application contains the improved parts of the outline of 'smartphone' for the Federal Iraqi Police FIP. The principle movement engaged with configuration is how to spare the application capacity of the gadget to help capture offenders, or on the other hand, aroma who has a criminal record in the database by cops and their records in data frameworks FIP. The research adopted a Methodology database My SQL contains records of lawbreakers and Criminals wanted to eliminate. A foot watch officer can send information through this application and find the solution rapidly. That is added to the advanced messaging methods below the error rate. The MySQL database tables are planned with the Application Development Kit XD to coordinate this proposed and appropriate model through the three Stations test tables in Baghdad city that chose by Population density and danger levels. The search method was used in designing a database My SQL and application software XDK For smart devices. The results show that 75.07 % of the system's response to the data available in the database that designed and will reduce the effort and time by searching for wanting criminals, and a criminal history in the virtual stations, that used in the city Related a large population density. New data access, the management system has been developed from the master database designed for this purpose and we can retain and retrieve data as needed.

Key-words: - Phone, Application, Smart, Database, SQL, XDK, Mobile

Path-Planning Dynamic 3D Space Using Modified A* Algorithm

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Abstract

Path planning is critical to the development of any robotic system or any autonomous moving vehicle in the modern world. The traditional planning algorithms such as the A*, D*, APF algorithms and more have scored great deal of efficiency along the way of path planning and navigating though some like the A* and D* lacks the ability to adopt the three-dimensional environments, since they have been intended to be light and fast in execution. This paper shows a modified version of the A* algorithm that works on 3D sphere space in both simple and cluttered environments. Giving ability to the algorithm to operate with float values and navigate around sphere obstacles safely, which is a closer scenario to the real world environments. The modified algorithm has the ability to avoid dynamic as well as static obstacles, generating semi-smooth and completely safe path from start point to the goal.

Keywords: A*, Path planning, AI, Dynamic environment, Sphere space.

Rider Optimization Algorithm implemented on the AVR Control System using MATLAB with FOPID

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Abstract. Considering the higher flexibility in tuning procedure and better control movement of the fractional-order proportional integral derivative (FOPID) controller over the traditional proportional integral derivative (PID) controller, this paper explores its application in the automatic voltage regulator system. FOPID contains five tuning boundaries when it appeared differently concerning three in the standard PID controller. The additional tuning handles in FOPID give extended control versatility and careful control action, in any case, their thought makes the tuning system progressively erratic and monotonous. Thusly, the knowledge of the Artificial Intelligent (AI) strategy called Rider Optimization Algorithm (ROA) is utilized to get a perfect mix of FOPID gains which further incited the perfect transient response and improved adequacy of the considered AVR system. To favor the introduction pervasiveness of the proposed approach its relating structure's dynamic response is differentiated and that of the other striking AI-based philosophies researched in progressing composing. Besides, the quality examination of the proposed AVR structure is finished by evaluating its pole/zero and bode maps. Finally, the intensity of the proposed overhauled AVR system against the structure's boundary assortment is evaluated by moving the time constants of all the four pieces of AVR: amplifier, exciter, generator, and sensor) from - 50 to +50% self-governing.

Skin Dermatitis Detection using Image Segmentation Techniques

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Abstract. This work, the image segmentation methods are proposed to provide a solution to a vital problem in health sector, which is detection of skin disease areas. Detection skin diseases has an important role to diagnose the affected area and treat them. In Health community considers this problem is vital because the accuracy of the disease recognition based on this step. We use three of image segmentation techniques namely, Morphology, K-mean and texture segmentation algorithms. These three methods have been applied on collected dataset of different skin dermis diseases. The results show these methods give reliable results to detect successfully the affected area on human skin.

Student Performance Prediction Model based on Supervised Machine Learning Algorithms

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Abstract

Higher education institutions aim to forecast student success which is an important research subject. Forecasting student success can enable teachers to prevent students from dropping out before final examinations, identify those who need additional help and boost institution ranking and prestige. Machine learning techniques in educational data mining aim to develop a model for discovering meaningful hidden patterns and exploring useful information from educational settings. The key traditional characteristics of students (demographic, academic background and behavioural features) are the main essential factors that can represent the training dataset for supervised machine learning algorithms. In this study, we compared the performances of several supervised machine learning algorithms, such as Decision Tree, Naïve Bayes, Logistic Regression, Support Vector Machine, K-Nearest Neighbour, Sequential Minimal Optimisation and Neural Network. We trained a model by using datasets provided by courses in the bachelor study programmes of the College of Computer Science and Information Technology, University of Basra, for academic years 2017–2018 and 2018–2019 to predict student performance on final examinations. Results indicated that logistic regression classifier is the most accurate in predicting the exact final grades of students (68.7% for passed and 88.8% for failed).

Study of the influence of the unauthorized blocks number on the speed and RAM expenses during the data analysis process

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Abstract—In order to the proper operation of the hardware and software systems and for increase of the reliability of legal data, it is necessary for the hardware device to receive data only from the corresponding software. Otherwise, the data received from extraneous device can lead to errors in the operation of the device or even to a complete loss of its functionality or data. In order to identify the challenges of the transfer of blocks, this study focuses on the influence of the number of unauthorized blocks, on the speed and RAM expenses during the data analysis process. The described method allows to reduce the costs of hardware, which exchanges and analyzes blocks of information. This is done with the help of a buffer to store information and with a set of mathematical equations. And measure the extent of the effect of intensity of receiving unauthorized blocks and hash field length.

Keywords—*Unauthorized Blocks; Method of reducing hardware costs; Hash; Buffer; Analysis of information blocks.*

Real Time Sleep Onset Detection from Single Channel EEG Signal Using Block Sample Entropy

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Abstract
In recent years, driver's temporary state has been one in each of the foremost causes of road accidents and would possibly lead to severe physical damaging, mortality and necessary and noticeable economic losses. Maximum road accidents possible to avoided, if possible, to properly monitored driver's drowsiness and a system are given warnings. In this work, a simple and inexpensive method has been offered to detect driver's drowsiness or sleep onset detection with single channel EEG signal analysis. The key novelty of this work is to identify the sleep onset detection from a publicly available graph signal dataset by exploitation only one feature, simply implementable filter in any microcontroller device or smartphone and a threshold based mostly classification. Since, threshold-based classification techniques don't need to train the classifier, hence, new subject adaptation is comparatively easier and real time implementation is more feasible. This novel approach can be easily implemented in smartphone to design and expand a drowsiness detection and alarming system for vehicle's driver. On a variety of subjects, the experimental results show 95.68% accuracy.

Keywords: drowsiness; sleep onset; electroencephalography; block sample entropy

An Improvement of ECDSA Weak Randomness in Blockchain

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Abstract

Blockchain technology has already changed industry and commercial enterprises remarkably. It is the underlying mechanism of a very well-known cryptocurrencies such as Bitcoin and Ethereum, and many other business applications. Therefore, its security draws the researchers' attention more and more recently. One of Blockchain vulnerabilities is caused by weak randomness in ECDSA. A random number is not secure, cryptographically, which leads to a leakage in private key and even the user's fund theft. As well the spam transaction attack may exploit the ECDSA weak randomness. This problem in security has been well known in cryptocurrencies community such as Bitcoin and fixed by applying RFC 6979 update in 2013. However, the problem is not entirely solved.

The elliptic curve digital signature algorithm (ECDSA) was the first successful algorithm based on elliptic curve. This algorithm security depends on complexity of elliptic curve discrete logarithm problem (ECDLP). This algorithm applied in blockchain mechanism as a result of its low computational cost and short key.

In this paper, we analyze the ECDSA weakness in blockchain and enhance its scheme by generating the signature with two secret keys. Using two secret keys will reduce the risk probability of revealing the secret key by knowing two messages. Therefore, the improved scheme can improve the security of the ECDSA.

Key words: ECDSA, Blockchain, digital signature, Bitcoin, random number.

Modified PRESENT Encryption algorithm based on new 5D Chaotic system

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Abstract

Cryptography is a major concern in communication systems. IoE technology is a new trend of smart systems based on various constrained devices. Lightweight cryptographic algorithms are mainly solved the most security concern of constrained devices and IoE systems. On the other hand, most lightweight algorithms are suffering from the trade-off between complexity and performance. Moreover, the strength of the cryptosystems, including the speed of the algorithm and the complexity of the system against the cryptanalysis. A chaotic system is based on nonlinear dynamic equations that are sensitive to initial conditions and produce high randomness which is a good choice for cryptosystems. In this work, we proposed a new five-dimensional of a chaotic system for a lightweight cryptographic algorithm. The proposed new chaotic system considers as super chaos. The NIST suite of all 15th tests is examined the proposed algorithm and showed high randomness and complexity.

Management of Mobile Knowledge Base

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Abstract

In the past years, Most organization have been disconnected management technologies. Now a day, organization seeking to increase innovation with models of business that moving to out sourced solutions, improving processes.

Knowledge management process today is increasing especially the acquisition and discovery carried out in mobile environment by the customers houses out of ever or through the road, bus train as where the mobile device are used instead of computer device for accessing to the high band width the network. Mobile knowledge management (mkm) is understand as usage of mobile accessing for establishing knowledge and document management system with user interface design.

In this paper show how the knowledge will be managed for mobile environment. then describe the types of mobile knowledge database which differs on the basic of knowledge processes on database. Aslo, show how built the mobile management system. In addition, define the technical media that's used in the mobile environment.

Keywords: mobile knowledge , mobile database environment, reference Architecture.

Skin Cancer Detection based on Terahertz Images by using Gabor filter and Artificial Neural network

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ABSTRACT

Over recent years, the technologies of terahertz system which represents optically-driven technologies are dramatically expanding and developing. The moneymaking applications of these technologies are now beginning to become known. Terahertz pulse imaging (TPI) is non-ionizing and has least effects on the human body, it has very large absorption due to water and metals highly reflect terahertz radiation, combining the terahertz and the pattern recognition which related to multivariate statistical tools lead to potentially provide a rapid and non-invasive method to diagnose and detect diseases. The proposed system has the ability to detect skin cancer tissue by using image processing, where images are pre-processed (resize, median filter), then the important information are extracted from the images in vector format by using Gabor features. Simulation results are efficient with less consumption time of the cancer detection using ANN algorithm with accuracy of 94.117%.

Keyword: Terahertz imaging technique, Gabor filter, neural network.

Android application to retrieve car details from car plate numbers

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Abstract

Computer vision is a field in computer science that has had great success due to the increasing popularity of machine learning. Instead of having a human look at images and decide what they depict, we are able to teach computers to recognize patterns of previous images and see the resemblance in new images. In this paper we will get car all information from his number plates through an Android Application which use image preprocessing and YOLO (You only look once) technique to detect the plates and then optimal character recognition to read the plates and Arabic numbers of the cars in Iraq and we have trained it using darkflow. Every Car has its unique Licensed number plate which will be scanned and give the details about the car. Computer vision can also be used to read alphanumeric characters in images and turn them into text. We have implemented API to detect the text and number in the plates. The purpose of this project is to develop a system for our Government and Police So that If police need details about any car he would easily access it. We have achieved the accuracy of 92.23% which means out of 3500 number plates 3220 read correctly.

Keywords: Computer Vision, CNN, Machine Learning, YOLO.

Development of an Optimized Botnet Detection Framework based on Filters of Features and Machine Learning Classifiers using CICIDS2017 Dataset

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Abstract

Botnet is a malicious activity that tries to disrupt traffic of service in a server or network and causes great harm to the network. In modern years, Botnets became one of the threads that constantly evolving. IDS (intrusion detection system) is one type of solutions used to detect anomalies of networks and played an increasing role in the computer security and information systems. It follows different events in computer to decide to occur an intrusion or not, and it used to build a strategic decision for security purposes. The current paper *suggests* a hybrid detection Botnet model using machine learning approach, performed and analyzed to detect Botnet attacks using CICIDS2017 dataset. The proposed model designed based on two types of filters to the botnet features; Correlation Attribute Eval and Principal Component deployed to reduce the dataset dimensions and to decrease the time complexity of the botnet detection process. The detection enhancement achieved by reducing the features of the dataset from 85 to 9. The training stage of classifiers is developed and compared based on six classifiers called (Random Forest, IBK, JRip, Multilayer Perceptron, Naive Bayes and OneR) evaluated to accomplish an optimized detection model. The performance and results of the proposed framework are validated using well-known metrics such as Accuracy (ACC), Precision (Pr), Recall (Rc) and F-Measure (F1). The consequence is that the combination of Correlation Attribute Eval (filter) with JRip (classifier) together can satisfy significant improvement in the Botnet detection process using CICIDS2017 dataset.

Keyword: Botnet Detection, Machine Learning, WEKA, Feature Selection, CICIDS2017 dataset.

Electroencephalogram Signals Classification Based on Feature Normalization

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Abstract

Data standardization is a fundamental process in which binary or multi- classification systems incorporate it as a sub-system in the classification- based question. Standardization can be called a mapping function moving from one space to another. Depending on the quality of the data, various types of normalization methods have been suggested. Research is underway recently on whether this approach is actually necessary. In this article, the various standardization methods efficiency is measured for the purpose of categorizing signal-based emotion with EEG. Binary classifier based on Naïve Bayes Classifier to classify the emotions. Only various kernel functions are considered for Naïve Bayes Classifier. While the experimental results may not show a substantial difference in performance between varrious types of normalization, the process of normalization generally improves emotion recognition classification efficiency.

Keywords: Electroencephalogram (EEG), Classification, Naïve Bayes Classifier

Feature Extraction and Classification of ECG Signal Based on The Standard Extended Wavelet Transform Technique: Cardiology Based Telemedicine

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Abstract
For early detection of cardiac abnormalities, an ECGs cardiac signal is relied upon due to it includes a lot of information that can be utilized for heart disease classification. The ECG signal is too sensitive to various types of noise since it is low frequency and has a small amplitude, these noises decrease the diagnostic accuracy and may outcome in a wrong decision by the clinician. Therefore, rejecting the ECG signal is a necessary condition for successful diagnosis of heart attacks. In this manuscript, the standard extended of Discrete Wavelet Transformc called Dual-Tree Complex Wavelet Transform (Dual-Tree (CWT)) method is utilized to denoise the noisy ECG signal and extract the key features followed by the implementation of the peak detection algorithm. The quality is measured based on performance metrics, and an increase in Signal to Noise Ratio (SNR) is achieved utilizing the technique. The heart rate (HR) calculation is in line with the gold standard of the various benchmark databases utilized for the proposed procedure and precise heart failure has been calculated.

Keywords: Electrocardiogram (ECG Signal), Dual-Tree Complex Wavelet Transform (Dual-Tree (CWT)), Peak Detection Algorithm, Blackman windowing(BmW).

Hybridization Method Based ECG Signals Classification

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Abstract
The ECG (Electrocardiogram) is the common reliable and easiest to utilize tool for diagnosis of cardiac arrhythmias. Manually diagnosing the arrhythmia beats is very hectic, as the ECG signals are non-linear and produce long records for analysis. It is very difficult for specialists to evaluate time domain features of minute variations, such as lines, intensity & intervals of ECG Signals in pure human judgments. This manuscript discusses an automatic approach to machine learning and the outcome of the initial algorithm identification of five separate heart rhythms. Support Vector Networks (SVN) is utilized to remove the features and besides that Independent Component Analysis (ICA) is the technique utilized to provide reduction of dimensionality. The kernel support vector machine function works for the tenfold classification and the ECG Signal cross validation. The concept of variance analysis is utilized to select significant features, and accuracy reliability is measured by the assist of Cohen's kappa statistics. The publicly available MIT-BIH database on arrhythmias is utilized to analyze various types of arrhythmias. This is a massive ECG data collection of various types of records and it includes five separate groups of classification arrhythmia such as SupraVEB, Non-ectopic, VEB, Unknown Beat(Ubeat) and Fusion beat(Fbeat). This methodology will produce an efficient tool to check a person's cardiac health which will produce a smart, automated technology for the specialist and paramedics to deal with heart arrhythmia.

Keywords: Arrhythmia, Electrocardiogram (ECG), Signal Classification, MIT-BIH database on arrhythmias.

Support Vector Network (SVN), Independent Component Analysis (ICA).

Virtual Environments Utilization for ECG Signals Analysis and Evaluation: Towards Heart Condition Assessment

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Abstract

The utilization of heart Electrocardiograms (ECGs) is to measure irregular heart rate and regularity and detection of an arrhythmia. Various ways are submitted and utilized for cardiogram feature extraction with a reasonable percentage of right detection. Although the problem stays open, especially with respect to superior detection accuracy in ECGs. In nature, The ECG signals are very sensitive signals, having voltage-level as low as 0.5-5 mv and frequency-elements fall into the range of 0.05-100Hz and the largest amount of the information received in the range of 0.05-45Hz. The recorded ECG signal includes various kinds of noises such as baseline wander, channel noise which becomes very critical to eliminating for the best clinical finding which assists in the patient. The utilization of the discrete wavelet transform (DWT) as wavelet transforms can be utilized to be a two-dimensional time scale process technique for feature extraction and classification task, therefore it's appropriate for the non-stationary ECG signals (because of the sufficient range values and the shift in a timely) in LabVIEW. To implement the feature extraction and classification tasks, a separating wavelet transformation (consonant), and the wavelet transform can be two-dimensional time-scale practical technique was utilized. Hence, it is relevant for non-constant ECG signals (because of sufficient scale-values and transformation in timely) in LabVIEW. The flexibility, standard nature and simplicity to utilizing programming possible with LabVIEW, makes it less complex. The pro-posed algorithm is executed in two steps. First step, de-noises the signal from the cardiogram signal to get rid of the noise, then detects the pulse, our extracted parameters are heart rate, P wave amplitude, T wave amplitude, S value, Q value, R-value, P offset location, P onset location, T onset location, T offset location and the location of P, Q, R, S and T wave.

Keywords: Electrocardiograph (ECG), Discrete Wavelet **T**ransform (DWT), Heart Arrhythmia, LabVIEW Software**.**

A New Medical Images Encryption algorithm Based on Gold Code: Futures Trends Towards Telemedicine

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Abstract

The rising necessity for telemedicine has made the healthcare sector an urgent and unlimited necessity to secure important data sent between medical centers for treatment purposes. The medical image encryption is a significant technique to attain a medical images security (MIS). There are numerous researchers utilized advanced encryption standard (AES) to guarantee of MIS. The direct application of AES encryption technology on medical images led to a long-time of processing; also it leads to a clear background regions, which are considered defects. This article includes the application of information theory (IT) to detect regions of the medical image that include, ROI (regions of interest) and ROB (regions of background). To reduce processing time and protect the medical image by utilizing AES with a higher degree of protection, a hybrid encryption is applied to ROI, and a method of coding such as gold code (GC) is applied to ROB after creation. The proposed method involves less time processing for the entire medical image of the AES application and has the best possible security as described in the entropy and link calculations.

Keywords: Information Theory (IT); Medical Image Encryption; Gold Code (GC); Advanced Encryption Standard (AES); Entropy.

Geometrical Fusion Based on Chain Code Representation

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Abstract
In this paper, a new geometrical image fusion method introduced by using the representation of chain code for the image objects that been matched among the images to be fused. The input images are separated into number of objects. A matching method is applied to extract the matching objects from the overall objects that included in the origin images. Then the chain code string is calculated for each one. The run length encoding is applied on that code strings to reduce the space that required. The image resulted from the geometrical fusion is more informative which contain the more important features those included in the origin images.

Leveraging Social Data for Hate Speech Classification

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Abstract

Through the rapid development that takes place on the Internet, hate speech is additionally spreading. We get it and take a see at the ways in which we have been inquired about through online modified strategies to dismiss the speech's substance location. Among these challenges are subtleties of dialect, different definitions of what incorporates upsetting talk, and states of getting to data to plan and test these systems. Other than, a few outstanding strategies test the pathogenic impacts of the issue of decoding capacity - that's , it is exceptionally troublesome to get it why outlines are set to the alternatives that in this paper we examine the innovation to uncover despise discourse on social media. We point to execute supervised classification technologies using a newly released data set described for this purpose. As features, our systems use many models Naive Bayes, Support Vector Machine (SVM), Neural Network. We get results with high accuracy in identifying posts in four categories. The results show that the main challenge lies in random profanity and hate speech from each other. Our proposed approach outperforms all modern methods with a significant increase in accuracy.

Keywords: Social Data, Hate Speech, Supervised Classifier , Neural Network, Naïve Bayes

Various Denoising Techniques Utilization For Qualitative Analysis of ECG Signal: Towards the Proper Diagnosis of Cardiovascular Disease

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Abstract

Electrocardiogram (ECG) is an extremely powerful method for cardiovascular disease identification. Nevertheless, the ECG data is corrupted during the recording of ECG signals by several forms of noises as for example, power lines interference, base lines wandering, electrode movement, muscle movement (EMG) etc. Such noises / artifacts confuse the proper diagnosis of heart ailments and therefore their removal is much needed. Up to some degree traditional filters exclude the artifacts, but these filters are static and cannot adjust their coefficients to environmental change. Adaptive filtering algorithm and EMD are also utilized to exclude artifacts from the ECG signals. To decompose a signal whose IMFs represents the mean of a set of measurements, each consisting of a signal plus a white finite amplitudinal noise.

Keywords: Electrocardiogram (ECG), Empirical Decomposition Mode (EMD), Cardiovascular Disease, Qualitative Analysis

Classifying Facial Expression using Convolution Neural Network

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Abstract

The human-computer interaction system is a success by deriving an effective facial expression recognition function. But it remains a difficult activity to understand facial speech. This paper sets out a novel Recognition of facial expression approach to the task. The approach proposed is motivated by the performance of the Convolutional Neural Networks (CNN) on the face trouble with identification. Unlike other plays, we focus on having good accuracy while requiring only a small sample data for training. The proposed approach is tested on Japanese Female Facial Expression (JAFFE). The accuracy increased compared with state-of-art results on the JAFEE dataset, where it achieved 95%.

Keywords: Facial expression recognition (FER), Convolution neural network (CNN), Facial expression (FE), Support vector machine (SVM).

Remote Monitoring and Smart Control System for Greenhouse Environmental and Automation Irrigation   Based on WSNs and GSM Module

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Abstract

This paper depicts the automatic irrigation and environmental monitoring inside the greenhouse based on WSNs (Wireless Sensor Networks) and GSM Module. The system is able to collect information about key environmental parameters, such as temperature, relative humidity, Water level within irrigation water tanks, light ratio, CO_2 dosage and soil dryness within the greenhouse. Analog signals from different sensors are converted to digital values by taking advantage of the ability of GSM (Global System for Mobile Communications) to convert analog signal to digital without the use of microcontroller. This information is transmitted wirelessly to the central computer to be processed and decided on by way of applying a simple fuzzy input system to send appropriate digital commands via the digital outputs of the system to regulate the glass house parameters within acceptable limits. The collected data and control commands that are applied in the database are stored to be analyzed for purposes of improving Agriculture.

Keywords: Greenhouse, Irrigation, WSNs, GSM, and Control System.

Security in social media policies: guidelines for strategies

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Abstract

This research investigates the security in social media and provided the guidelines and strategies toward minimizing the security risks in social media to collect parts of information and increase better practices to assist nations with tending to social media security changes adequately. Besides, this work further features more in the writing dependent on social media security dangers and rules to lessen it and furthermore outlined the key bits of knowledge to push our nations to effectively address these issues of social middle security chance. Great associations don't contain a coercive social media security way set up and are dubious of how to make sturdy social media security systems to forestall social media security risks. This work can be filled in as a trend to associations to moderate social media security hazards that might compromise the associations. The flow investigates further merges the divided conversation in writing and gives a profundity investigation of social media security dangers, rules, and counteraction systems. Reasonable bits of knowledge are distinct and outlined from a wide investigation. Sharing this interesting information could possibly energize more conversation on bestead pursuits for contraction the risks of social media to those associations.
Keyword: Social Media, Network, Security, policy

Age and Gender Classification using Multiple Convolutional Neural Network

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Abstract

Since the advent of social media, there has been an increased interest in automatic age and gender classification through facial images. So, the process of age and gender classification is a crucial stage for many applications such as face verification, aging analysis, ad targeting and targeting of interest groups. Yet most age and gender classification systems still have some problems in real-world applications. This work involves an approach to age and gender classification using multiple convolutional neural networks (CNN). The proposed method has 5 phases as follows: face detection, remove background, face alignment, multiple CNN and voting systems. The multiple CNN model consists of three different CNN in structure and depth; the goal of this difference It is to extract various features for each network. Each network is trained separately on the AGFW dataset, and then we use the Voting system to combine predictions to get the result.

Keywords: age classification, convolutional neural networks(CNN), computer vision.

Lifetime Enhancement to Improve Data Transmitted for Clustering Protocol in Heterogeneous Wireless Sensor Networks

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Abstract

The most important consideration in designing protocols for wireless sensor networks is the energy constraint of nodes because in most cases battery recharging is inconvenient or impossible. Therefore, many researches have been done to overcome this demerit. Clustering is one of the main approaches in designing scalable and energy-efficient protocols for WSNs.In this paper, we proposed a novel scheme to investigate the cluster, the Fuzzy Logic Cluster Stable Election Protocol (SEP - FUZZY), which uses Fuzzy Logic Inference System (FIS) in the cluster process. We compare our technique with three approaches (LEACH, BEGASIS, and SEP) to show that using a multi parameter FIS enhances the network lifetime significantly. Simulation results demonstrate that the network lifetime achieved by the proposed method could be increased by nearly (47%, 35.7%, and 23.8%) more than that obtained by (LEACH, BEGASIS, and SEP) protocols respectively.

Keywords: WSNs, clustering, fuzzy logic,SEP.

PAM Clustering Aided Android Malicious Apps Detection

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Abstract. The exponential growth of android contrivances has attracted cybercriminals strongly and dramatically. The applications existed in the android market represented an attack surface owing to the lack of security mechanisms applied by the Google play store. Additionally, downloading apps from unofficial sources lead to a further security threat. Any mobile application requests several permissions to access users' data to run the app. Thus, attackers exploited this feature in compromising users' sensitive data. This motivated several researchers to investigate security mechanisms to detect Android malware based on this feature utilizing machine learning techniques, particularly classification techniques. However, This research proposes a permission-based android malware detection framework using a clustering algorithm. Further motivation for this research is that large datasets labeling is a tough mission. Therefore, Our work will contribute to android malware detection as well as android apps datasets labeling. PAM (Partitioning Around Medoid) clustering has been exploited for this purpose since its less affected by outliers or other extreme values. The most significant features have been selected as an input to the clustering algorithm to enhance its results. The results depicted that our clustering algorithm was able from grouping our dataset into two categories malevolent and genuine apps. Moreover, our result has been validated by evaluation standard F-Measure, which is counting for 0.86 for 40 attributes subset, while it is 0.88 for 30 features subset. This reveals a good performance level of permission-based android malware detection and android applications datasets labeling into malware and good ware.

Keywords: Android malware, PAM clustering, Permission, Feature selection.

Survey: Affective Recommender Systems Techniques

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Abstract

Abstract: Recommender systems (RSs) are software tools or techniques that support the user in the decision-making process by suggesting possibilities that the system predicts. RSs are associated with numerous applications such as Amazon.com, for a book recommendation, compact disks, and other items, MovieLens, for the movie, and VERIFIED technologies, for news articles recommendation. There's a critical range as of late showed up which is an affective recommender framework. The affective recommender is related to human behaviors. Due to this combination and distinctive interests, more statement is required, since it is in awkward organize and creating as compared to other ranges. So we have done a literature survey within affective recommender systems techniques. In affective recommender field, we tried to illustrate how the affective behavior of the user can be used in recommender systems.

Keywords: Affective recommender systems (ARSs), Content-based filtering, Context based filtering, Collaborative filtering .

EFFECTS OF VOLATILITY AND TREND INDICATOR FOR IMPROVING PRICE PREDICTION OF CRYPTOCURRENCY

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Abstract

The purpose of this research is to identify how effective the determinants of the improved price changes in cryptocurrencies are and if they are predictable. The study addresses several independent variables that are in our consideration which may impact the prices the most. To obtain the results, panel data has been used to run fixed effects models. Then we treated them as time series data to run dynamic trend indicator and first-differencing volatility regression model. Important political shocks and instabilities have been analyzed and interpreted in this paper. In the light of our findings we were able to comment on the complex relation between cryptocurrency prices and socio-political situations throughout the time range. The results address that cryptocurrency price changes are predictable. It is easy to say that major stakeholders (Apple, Amazon, Facebook, Google, Tesla) affect the most prices. Internet search trends seem to have an impact but at the end it has been found that the correlation is strong. We have evaluated all the major cryptocurrency prices with exact accuracy of 95.38% using the volatility regression model effectively. All the cryptocurrencies are evaluated against US dollars in regard of different cryptocurrency like Bitcoin, Ethereum, Litecoin and Ripple digital currency. Cryptocurrencies shouldn't be seen as a gambling medium and should be taken more seriously like an investment medium. In some specific occasions investing in cryptocurrencies may lead lucrative income.

Keywords: Cryptocurrency, trend indicator, regression model, prediction, bitcoin, volatility, government.

Near Real Time Twitter Sentiment Analysis and Visualization

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Abstract

Twitter can be considered as a large scale network. People's opinions matter a lot to analyze how knowledge spreads impact lives. In this project, we took advantage of the Apache Spark Streaming fast and memory computing platform to retrieve live tweets and perform sentiment analysis. The primary purpose is to provide a tool to evaluate the score of sentiments in streams. This paper reports on the nature of an analysis of emotions, collecting vast numbers of tweets. Results identify the view of users through tweets into positive, neutral and negative about coronavirus.

This project on Spark Streaming to analyze tweets, hashtags or specific keyword/keywords such as (corona) from live twitter data streams. Data is collected from input sources like Twitter and processed downstream using Spark Streaming. Then, how sentiment scores can be generated for tweets and build visualization dashboards on the data using Elasticsearch and Kibana.

Keywords: Twitter, Spark Streaming, Kibana, dashboard, Elasticsearch, Sentiment analysis.

Comparative Study of Classification Algorithms to Analyze and Predict a Twitter Sentiment in Apache Spark

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Abstract

Nowadays, the major sources of information exchange are Twitter, Facebook, WordPress, etc. The tweets can be considered as the source of the public opinion on an event, a product, or a topic. Consequently, it contains large volumes of natural data. Enormous dataset contains a huge volume and variety of information. Therefore, it cannot be prepared utilizing normal conventional tools. It can be processed by building up distributed environment or by contracting cloud based isolated infrastructure. Therefore, better approaches and instruments are required to bring the respect of the information. Apache spark is actually appropriate for performing machine learning on large-scale information. To discover out how rapidly Spark processes of huge information, we make an approach that utilize Machine Learning library (MLlib) classification algorithms in Apache Spark. We implement Logistic Regression, Multilayer Perceptron (MLP), Random Forest and Support Vector Machine (SVM) and compare among them. The models are for analysis and predicting the sentiment based on a corona tweets. A sentiment analysis based on tweets is a challenging issue. The classification algorithm is assessed by precision, recall, f-measure, accuracy and time consumed. The results show that logistic regression algorithm has higher speed in doing enormous information processing than other chosen algorithms. Moreover, according to the obtained results, apache spark has exceptionally great speed in handling big data. The classification algorithm is assessed by precision, recall, f-measure, accuracy and time consumed.

Prediction Breast Cancer as Benign or Malignant in Apache Spark Framework

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Abstract
There are number of diseases that increase the number of deaths over the world. Breast cancer can be considered as the most common of them. Therefore, there is a need to use classification and others data mining methods to study the health datasets in order to diagnosis and make decisions. In this paper, Support Vector Classifier model, Logistic Regression algorithm, and Random Forest algorithm are conducted on the public available Wisconsin Breast Cancer dataset. The experiment is executed in a Scala environment. Moreover, in single and multi-nodes spark cluster. The results show the high accuracy in Support Vector Classifier model and the low error rate in less time consumed when compared with other studies. The authentication in spark are applied in the application by using shared secrete method.
Keywords: Classification, Prediction, Apache Spark, Single Node, Multi-nodes Cluster.

PROPOSED METHOD FOR IMAGE SEGMENTATION USING GRAPH THEORY

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Abstract: This paper presents an image segmentation technique using graph tools for object detection. Graph theoretical systems have many good features among different segmentation schemes. It organizes the image elements into mathematically and structural form, and makes the problem formulation more flexible, and the computation more efficient. In this paper, the work, consists of two stages, in the first stage we apply the pixel-based labeling algorithm to the binary image, the algorithm works similarly to the eight connectivity labeling, but it is broader than it in terms of the search area, where two (horizontal and vertical) thresholds are first defined so that the search is in a block whose height is the vertical threshold and its width (2 * horizontal threshold), in the second stage the output of the first stage is mapping into an undirected weighted graph, in which each vertex represent region rather than pixel. We evaluate the results by comparing it with other method using (RI) parameter. We use 50 image from online source and image taken from Berkeley database.
Keywords: CCL, segmentation based-graph, graph.

Vision-Based Obstacle Avoidance for Small Drone using Monocular Camera

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Abstract

This paper proposes an obstacle avoidance technique for small size drones by using a monocular camera. This method can assist the drone for doing their mission and avoid hitting any obstacle or minimise the collision as possible. For avoiding an obstacle while the drone is doing its mission, We use a computer vision technique to determines the free zone along with the obstacle that may cause a crash and send feedback control to the drone. The small size drone receives feedback about the obstacle and commands the drone to moves to a safe area then resume its trajectory.

Keywords: obstacle avoidance, trajectory follows, monocular camera, computer vision.

Comparing between KM and RTM Algorithms to Pre-Stack Migrate Seismic Data

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Abstract

Creating a clear seismic section to explore the underground is the primary goal of seismic surveys. The seismic section is created by processing the data obtained from the seismic survey. Migration is an important seismic data process, as it puts reflections in place. In this research, the Kirchhoff Migration (KM) algorithm and the Reverse Time Migration (RTM) algorithm were applied using MatlabR2019 software on two industrial models, comparing the results by calculating the brightness on the resulting image and after calculating the contrast and adjusting the seismic section. The results showed that the use of the RTM algorithm gives more clear results than the results obtained when applying the KM algorithm.

Deep Learning with network of Wearable sensors for preventing the Risk of Falls for Older People

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Abstract. Activity recognition (AR) systems for older adults are common in residential health care including hospitals or nursing homes; therefore, numerous solutions and studies presented to improve the performance of the AR systems. Yet, delivering sufficiently robust AR systems from sensor data recorded is a challenging task. AR in a smart environment utilizes large amounts of sensor data to derive effective features from the data to track the activity daily living. This paper maximizes the performance of AR system from using the convolutional neural network (CNN). Here, it analyzes signals from the network sensors distributed in different places in two clinical rooms at the Elizabeth hospital, such as W^2ISP and RFID sensors. The proposed approach recognized the daily activities that consider a key to falling cases for older adults at a hospital or a nursing health house. A deep activity CNNets is used to train the effective features of daily activities sensors data then used for recognizing the highest falling risk activities in testing data. This approach used existing data of fourteen healthy older volunteers (ten females and four males) and then compared to other proposed approaches that used the same dataset. The experimental results show that this approach is superior to others. It achieved (96.37±3.63%) in the first clinic room and (98.37±1.63%) in the second clinic room. As the result, this experiment concludes that deep learning methodology is effectively assessing fall risk based on wearable sensors.

Keywords: Activity Recognition, CNNets, RFID sensor, Deep Learning, Convolutional neural network

A novel Face Recognition System based on Jetson Nano developer kit

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ABSTRACT

Real_time face recognition became more important in the last two decade, it is adopted universally for attacking crime, stopping fraud, ensuring public safety. It proves that it is one of the most reliable biometrics security systems because frames can be taken from cameras without touching or interacting, and those images recorded and spontaneously validated with existing databases. The methodology achieved in this work will deal with several challenges like real_time recognition, cheap, portable, and reliable system. NVIDIA Jetson Nano is used in this work. It is a tiny, powerful AI computer that delivers the estimated performance to run advanced AI workloads with a small size, low-power, and low-cost. The main goal of this research is to deploy a deep learning model for face recognition in Jetson Nano, with the intention of real-time performance and high accuracy. The results of this study have shown great real-time performance in face recognition using Jetson Nano, Where it was processing 8.9 FPS in comparison with the latest raspberry pi edition 2.6 FPS.

Keywords: *Face Recognition; Jetson Nano; Raspberry Pi; Surveillance system; real time systems RTS; Security systems.*

Similarity metrics for classification: A Review

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Abstract. In this paper, fourteen similarity metrics are reviews, which will be the most important part in Diagnosis, Classification, Clustering and Recognition. Most researchers may not sure to choose which metric will be powerful and give high accuracy in them researches. Therefore, this paper will be as a guide for them to select which metric useful for them research by try one of fourteen metrics that listed in this paper and can compare one of these metrics by advantage and disadvantage of each one. In addition, there are new metrics modified to give more accuracy by testing them in some clustering application.

Keywords: similarity metrics measurements, Diagnosis , Classification, Clustering, Recognition and distance-based measurements

Hybrid Algorithm to Solve Timetabling Problem

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Abstract

The university course timetabling problem is a well-known highly-constrained difficult optimization problem. The problem seeks the best allocation of courses to time slots and rooms while ensuring all related constraints are satisfied. Due to the limited resources (rooms and time slots), finding an optimal, or even a high quality, timetable is a challenging task that every university encounters every semester. Many metaheuristic algorithms have been proposed for university course timetabling problem. Genetic algorithm is a class of metaheuristic and has shown very good results for many real-world problems. However, for university course timetabling problems, a traditional genetic algorithm is not usually considered as an efficient solver because it is very hard to maintain the solution feasibility. In this research, we propose a new hybrid algorithm that combines genetic algorithm with simulated annealing to find good solutions for university course timetabling problems. The proposed hybrid algorithm uses simulated annealing in adaptive manner to rectify solutions and to improve the quality of the generated solution by genetic algorithm. The proposed algorithm is tested over Socha dataset from the scientific literature and compared with the state of the art methods.

Key Words: Genetic Algorithm, Simulated Annealing, Hybrid Genetic Algorithm, Timetabling, University Course Timetabling.

WATER QUALITY MONITORING SYSTEM BASED ON IOT PLATFORM

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Abstract
Water treatment monitoring systems are presently divided into manual and dynamic systems. Due to, the constant changes in water, either due to seasonal changes in water chemistry or due to the operative conditions of the industrial environment, the dynamic systems have to be utilized by the water manufacturers. However, water is very beneficial for life and human health, therefore to reduce the endangerment of pollution, by improving and increasing the plant operation in addition to production. This paper suggests a new technique for water factory manufacturers by adopting wireless sensor nodes. The monitor node connected with a microcontroller device using Esp32 as transmitter and receiver nodes. The node sends its statues over the wireless network utilizing a defined internet protocol (IP). The proposed system shows its effectiveness in water monitoring systems through synchronous water monitoring and simple configuration compared to traditional systems.
Keyword: IOT, ESP 32, water monitoring, PH, TDS.

An Overview of Periodic Wireless Sensor Networks to The Internet of Things

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Abstract

Through developments in digital electronics and wireless technology, a variety of tiny devices have begun to be used in many aspects of everyday life. These devices can sense, compute and communicate. These typically consist of low-power radios, many smart sensors, and integrated CPUs. Such devices are utilized to establish a wireless sensor network (WSN) essential for the delivery of sensing services and monitoring of weather conditions. The concept of the Internet of things (IoT) is formed in conjunction with WSNs, where IoT can be described as an interconnection between recognizable devices in sensing and monitoring processes inside the internet networks. This paper offers a description of Periodic WSNs in general. It also offers an overview of the PWSN applications and challenges.

Index Terms— Wireless Sensor Networks, Periodic WSN, IoT, Sensor Node.

Evaluation of Scheduling Algorithms for Multimedia Applications over Dual-Stack Network

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Abstract—This research has been dealing with a topic of dual-stack networks of issues providing Quality of Service (QoS) in (IPv4/IPv6) dual-stack environment and analysis of various applications such as FTP, voice and video of QoS in these networks.

The future IP networks are relied upon to utilize IPv6 instead of IPv4, in light of the fact that IPv6 has been intended to fulfill the future system QoS necessities and IPv6 arrange offers huge points of interest over the current IPv4 organize. It will require a certain investment to change from IPv4 to IPv6. So that IPv4 and IPv6 will exist together amid the change period. In this examination, we embrace the Dual-Stack Transition Mechanism (DSTM) to think about system execution with scheduling algorithms applied QoS methods on (IPv4/IPv6) dual-stack traffic has been executed testbed created specifically for this study, with a view to validate the methods and evaluate the router's overall execution. This paper is considered three queuing systems which are First In First Out (FIFO), Weighted Fair Queuing (WFQ) and Priority Queuing (PQ) as a comparative study to investigate their effects on real-time applications in (IPv4/IPv6) dual-stack networks support. Meet the simulation environment OPNET Modeler where the simulation results are collected and analyzed.

The networks that have been styled consist of various pieces as a switch, device node, routers and servers. The performance metrics considered in this paperwork is jitter, end-to-end delay, traffic sent and received etc.

Index Terms— *QoS; Dual-Stack; WFQ; FIFO; IPv4; IPv6*

SDN-RA: An Optimized Reschedule Algorithm of SDN Load Balancer for Data Center Networks Based on QoS

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Abstract

With the development of cloud computing during the latest years, data center networks have become a great topic in both industrial and academic societies. Nevertheless, traditional methods based on manual and hardware devices are burdensome, expensive, and cannot completely utilize the ability of physical network infrastructure. Thus, Software-Defined Networking (SDN) has been hyped as one of the best encouraging solutions for future Internet performance. SDN notable by two features; the separation of control plane from the data plane, and providing the network development by programmable capabilities instead of hardware solutions. Current paper introduces an SDN-based optimized Reschedule Algorithm (called SDN-RA) for cloud data center networks. The SDN-RA performance is validated and compared as results to other two corresponding SDN; ECMP and Hedera methods. The simulation environment of current work implemented using Fat-Tree topology over Mininet emulator which is connected to the Ryu-SDN controller. The performance evaluation of SDN-RA shows an increase in the network in terms of throughput and link utilization besides a reduction of RTT delay and loss rate.

Keywords: cloud data centers, software defined networking (SDN), Congestion control, load balancing, traffic scheduling, SDN-RA.

Using LoRa Technology to Monitor and Control Sensors in the Greenhouse

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Abstract:

Due to the fears from the corona pandemic and its consequences from curfews, spacing, and the difficulty to reach work centers, including the greenhouse in the agricultural sector. The idea arose to use LoRa, one of the latest wireless communication technologies, which has the ability to connect and use the Internet of Things (IoT) to ensure monitoring, management, and control in any workplace. LoRa technology will serve as the backbone of our design for the wireless network system to monitor and control greenhouse sensors, the design consists of two parts: The first is to prepare a group of sensors that support the (IoT) and its mission is to measure and control inside the greenhouse and send data using LoRa technology to the next section. the second section is to monitor and control the readings data remotely, using LoRa technology to receiving first section data, and connecting it to the Internet or using the (IoT) network to provide access, monitoring, and control from anywhere in the world. the readings can have obtained after uploading it to the cloud computing, the data deal with a website which allows monitoring the sensors wherever the internet service is available, the system also gives the ability to send a feedback signal to the greenhouse. The project provides integrated greenhouse control at a distance of 2 to 15 km. and it represents as a fundamental solution to the current situation that is forced to remotely control our business to stay in homes for as long as possible to avoid corona disease.

Keywords: LoRa, Internet of Things, Greenhouse, Monitor, Control.

A NOVEL FOOD IMAGE SEGMENTATION BASED on HOMOGENEITY TEST of K-MEANS CLUSTERING

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Abstract
Data clustering is an important machine-learning topic. It is useful for variety of applications one of them is image segmentation. A given divided image into regions homogenous additional to certain features is the image segmentation process, which matches real objects of an actual scene. FIS (Food Image Segmentation) is important for calories estimation. K-means has been used for performing such task. However, in order to conclude the food items number in the image, it requires interacting with the application. This article, presents a novel approach based dependently on k-means named Hk-means (Homogeneity test of k-means) is developed to calculate k value and applied for FIS for the purpose of assuring full autonomy in the calories estimation system. This approach uses the homogeneity test so as to compensate the new item existence in the image. The suggested method Hk-means is tested on food images and show accuracy 96%. The experimental results has achieved 1.5 second execution time when compare with benchmark method.

Keywords: image segmentation, k-means, clustering, computer vision, statistical processes

Face Recognition Using Various Feature Extraction Approaches

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Abstract

 This paper introduces an experimental study on the recognition of the person's face by utilizing three
Techniques of extraction: Principle Components Analysis (PCA), Linear Discriminant Analysis (LDA) and Contour
Curvelet Transform (CCT). The results of these approaches were observed and compared to discover the perfect sche
for identification of human faces. The tests have been carried out on the
faces databases of (ORL) ,(UMIST), and (JAFFE). The results acquired by the methods were quantified by altering
ratio of train to test photos in three categories: 75/25, 55/45 and 35/65. The evaluation results showed that
CCT extraction method provides better results than the others. The highest recognition rate was recorded for the C
approach (recognition rate=98.980%) when the (train /test) photos ratio is (75/25). Furthermore, the best recognition ra
for the LDA and PCA were 96.391% and 95.127% respectively. The Matlab R2019b program was used for implement
and testing the algorithms.

Keywords: Contourlet -Curvelet Transform, CCT, LDA, PCA and Face Recognition.

Face Recognition and Emotion Recognition from Facial Expression Using Deep Learning Neural Network

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Abstract
Face recognition, emotion recognition represent the important bases for the human machine interaction. To recognize the person's emotion and face, different algorithms are developed and tested. In this paper, an enhancement face and emotion recognition algorithm is implemented based on deep learning neural networks.   Universal database and personal image had been used to test the proposed algorithm. Python language programming had been used to implement the proposed algorithm.

A Technique for Big Data Deduplication based on Content Attributes and Dictionary Indexing

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Abstract: In recent years, the quick expansion of the data such as text, image, audio, video, data centers, and backup data has caused to a lot of problems in both storage and recovery processes. The companies spend plenty of money to store the data. Hence, a need for an efficient technique becomes necessary for handling enormous data. In this paper, we propose to set up for new de-duplication for the contents of big data set. The divisors are selected in an automated way using the fields separator, different dictionary indexing methods will be used to de-duplicate the fields contents those have bounded variability. Also a set of computationally low-cost hash functions will be used for speeding up the deduplication for fields consist of long strings. The number, nature, and length of fields will be tested. Besides that, certain kinds of indexing and clustering methodology will be applied to define the optimal way to decrease the data size before making de-duplication.
Keywords: Big Data; Hashing; Encoder; Indexing; Data De-duplication.

Design and implementation smart multi language sound guide using raspberry pi and RFID system

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 Abstract
A conventional phonetic expression into the museums, exhibits, and spectacular places, is hard to ensure the quality demands of the visitors, on account of the languages difference and the large numbers of visitors. Hence, it is essential to develop a Multilanguage sound system, which can answer the different demands of various language users for the same exhibition. The system included RFID technology and a raspberry pi device. The system can define the language of the expression according to the demands of visitors, and then it could provide visitors extensive information about the exhibition in a clear, noise-free sound, as Clear and understandable. This will reduce the workforce and increase performance, but it also can completely ensure the quality of the expression.

Keywords— Raspberry pi ; RFID.

Algorithm for CPU resource allocator case study and compering between ordinary and ML Algorithms

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Abstract

The problem of resource allocation of scarce is a very important task especially in dynamic and non-stable environments when the importance and priority of recourse are changing while the system is already working in our work firstly we simulate the problem by mathematical model than the essential part is to use intelligent algorithms like comparing random scheduling, hill climbing, simulating annealing and genetic algorithms, by using these tactics of such kind of algorithms we designed an algorithm that can handle with every type of multi-agent learning-based resource allocation for distributed systems that act place of most promising approaches to these kinds of allocating systems problems. The approach will be authorized by achieving on different types of large scale systems than correlated with the regular algorithms to compare the result and get the efficacy of new algorithm.

Keyword: resource allocation, intelligent algorithm, memory allocator, CPU deadline, machine learning.

Augmented Reality Technology in Education

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Abstract

Augmented reality technology has entered the field of education, and augmented reality is one of the innovations of technology. The educational institutions that allow uniqueness and enrichment of educational jobs through feeding them with many different sources and alternatives, which constitute an integrated combined methodological unit aimed at achieving ideal learning that is characterized by a large degree of effectiveness, efficiency and mastery and supports the learning process through its new and different by adding audio, 3D, and video. This technology transmits information by adding a new virtual image (audio visual information) to the still image (the real world) and this allows the learner to interact with this technology by dealing with additional information or objects that are displayed in the real world. In this paper, the proposed method for promoting and supporting the traditional method of teaching and converting difficult and complex materials into easy materials is presented easy to understand and memorize, which is called Technology Enhanced Learning (TEL). In this technique is produced virtual elements such as explanatory video, audio and three-dimensional shapes, these elements are stored in the database and linked to the note in the study material created when the learner focus the phone camera towards the mark, then camera picks up the mark, and opens the default elements on the phone screen.

Keywords: Augmented reality , virtual reality , marker , Traditional education.

Encrypt Audio File using Speech Audio File As a key

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Abstract in this research, a new method for audio (.WAV) file encryption is propose using a random modification with two secret key applications. The proposed method provided a highly secure audio.WAV files and efficient audio files which have very high-frequency band. The proposed system is to convert speech audio file to text form, this text creates password seed with two keys using hash function, the first key encrypted using proposed algorithm then these keys used to encrypt the original audio (.WAV) file by using Rijndael algorithm.
Keywords. Speech audio file; Encryption; Decryption; Audio; Hash function; Rijndael algorithm Speech Recognition.

Classification of Micro-array Data in Apache Spark Framework

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Abstract

Apache Spark is an emerging huge information analytics technology. Machine learning (ML) frameworks engineered on Spark are more ascendible compared with traditional ML frameworks. We tend to build SVMwithSGD(SVM with Stochastic Gradient Descent) and LinearRegressionWithSGD models by using Spark Python API (PySpark) to classify normal and tumor microarray samples. Microarray measures expression levels of thousands of genes in a very tissue or cell kind. Feature extraction and cross-validation are used to make sure effectiveness. The SVMwithSGD and LinearRegressionWithSGD models achieve associate degrees accuracies quite eightieths.

This paper presents a study of feature selection methods effect, using a filter approach, on the accuracy and time consumed of supervised classification of cancer. A comparative evaluation among different selection methods: Principal Component Analysis (PCA), Independent Component Analysis (ICA) and Locally Linear Embedding (LLE) is carried out with SVMWithSGD or LogisticRegressionWithSGD classifier, using the datasets of prostate, cancer, lung and Huntington's Disease samples. The classification results using SVMWithSGD and LogisticRegressionWithSGD (LGWithSGD) classifiers show that the SVMWithSGD classifier can present the highest accuracy and much time when compared with LGWithSGD. The results show that when we have classified with SVMWithSGD, PCA and SVMWithSGD is the best combination for analyzing the Borovecki, Gordon, and Chowdary datasets. While ICA and SVMWithSGD in the Singh and Chin datasets. Moreover, the results illustrate that when we have classified with LGWithSGD, PCA and LGWithSGD is the best combination for analyzing the Borovecki and Gordon datasets. While ICA and LGWithSGD in the Chowdary and Singh datasets. LLE and LGWithSGD is the best for analyzing Chin dataset.

KeyWords : PySpark, Spark, Machine Learning, Support Vector Machine, Feature Extraction, Feature Scaling, Dimension Reduction, Principal Component Analysis, Cross-Validation,   independent component analysis, Stochastic Gradient Descent, Locally Linear Embedding.

Enhanced Multistage RSA Encryption Model

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Abstract:

Digital data amounts are expanding quickly every day over the Internet. Security plays an essential role in the advancement of communication system , particularly with confidential material transmitted over a network because of the continuous availability of digital data and effective attackers try to access these data cryptography becomes one of the most major fields used, an essential and necessary field for achieving a high level of protection between distinct individuals. Efficient and new editions of cryptography algorithms can help decrease security risks, any type of data has its own confidentiality, so new algorithms should be used to protect confidential data toward unauthorized access. After reviewing the RSA and attacking it, it would appear that a new model should be improved to mitigate this attacks and improve the security of the RSA algorithm. In this research increasing the complexity and search space of RSA algorithm against brute force attack in addition to security enhancement was satisfied by applying four cases with using different cryptography algorithms. This four cases included case1: enhanced the security of RSA by using Optimal Asymmetric Encryption Padding (OAEP), case2: combining of the two most important algorithms RSA and Diffie-Hellman (D-H), case3: for increasing complexity and obtaining high level of security the two above cases (case1& case2)were concatenated, finally for most complexity and obtained highest security level with increasing search space of RSA case4 was applied. Case4: contained implementation of case3 in addition to apply new level of security by adding another cryptography algorithm called HiSea algorithm. The results of using multiple cryptography algorithm in each case of the above four cases respectively improved security level by increased the complexity and key search space that lead to protect the security goals against the attackers. Case4 is the best case because it provides most efficient complex and accurate encryption system that used the processing of encryption data multiple times using different strong algorithms.

Keyword: Brute force attack, Cryptography, D-H, HiSea, OAEP, RSA, Security.

CNC Software Control System Using Visual Basic

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Abstract

   Computer Numerical Control (CNC) machines are having a great industrial role in the progress of humanity to furnish an exactly crafted pieces for different tools and instruments. In the last decade their use had become more popular due to the cheap microcontrollers that emerged and still emerging. The 3D printers' availability made manufacturing of CNC machines simpler. But the need for easing the means to program a CNC machine is still required. This paper gives a software which is intended to make dealing with G-code used with this type of machines easier. This software allows the user to execute manually any step he wants in predefined steps which can be changed on demand, return to origin of working palette, control the working head to any level demanded. Also, it can transform any G-code already prepared to the CNC machine. This software is built using the visual basic vb6.net. The microcontroller used is the Arduino uno, the mechanical set is locally prepared, and the presented application is for line drawing. CNC machines can do a variety of jobs including; drilling, plotting, engraving, laser cut, PCB drilling … etc. This software had been tested successfully for drawing with ability to show the G-code for each manual movement. Applying it to other CNC applications demands changing the operation head and care for each condition application circumstances.

Keywords: CNC, 3D printers, ARDUINO UNO, G-code.

An Effective Load Balancing Algorithm Based on Deadline Constraint Under Cloud Computing

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Abstract

Cloud computing is one of the attractive topics in distributed systems. It provides services on-demand based on pay-as-you-go basis. Task scheduling and load balancing are important research issues in cloud computing. Task scheduling means distributing tasks to resources (Virtual Machines) while load balancing refers to distribution tasks among resources to even workload. In this paper, we propose an Effective Load Balancing Algorithm with Deadline constraint (ELBAD). The ELBAD allocates nearest deadline tasks each time to the highest speed Virtual Machines (VMs) then it balances workload among VMs. The proposed algorithm is compared with other existing algorithms such as FCFS, SJF, Min-Min and EDF and experimental results show superiority of ELBAD over others with respect to minimizing makespan and maximizing resource utilization.

Keywords: Cloud computing; Makespan; Deadline constraint; Virtual Machine; Load Balancing; Task scheduling

Analysis of Criminal Spatial Events in GIS for predicting hotspots

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Abstract

The crime rate increasing in developing countries cause of the unequal distribution of psychological, economic situation. This research aims to identify the crime mapping and investigate the hotspots and analyzing the spatial crime dataset and the predict of Spatio-temporal hotspot in Baltimore city for a period from 2012 to 2018. Analyzing crime data using data mining algorithms and The Geographic Information System (GIS) of Geographic dataset visualize and it possible for law enforcement to detect spatial crime patterns map easy and flexible and different analysis to identify the crime hotspot region efficiently. analysis crime hotspot using GIS is a useful way to the recognition for crime pattern and predicting hotspot over spatial correlation, analysis spatial data and revile crime pattern future detection. using spatial correlation, the G* statistic has been done with hotspot analysis the Getis-Ord Gi* to find the result of the spatial statistics pattern. analysis the crime to predict hotspot uses spatial variation and density crimes for clarifying the positions of statistically significant crime predict hotspots and cold spots and GIS interpolation method is used for more efficient visualization. This research using Grid network hotspots are applied to the crime data of Baltimore, Maryland state to recognize the hotspots for crime data like Shooting, Homicide and Assault by threat.

Keywords: *Crime Analysis; Hotspot; Getis-Ord Gi*; GIS*

Evaluation of Transfer Learning with CNN to classify the Jaw Tumors

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Abstract
Artificial Intelligence" (AI) This term refers to the idea that the machines can perform human tasks. Recently, researchers, professionals and companies around the world introduce deep learning and image processing systems that can analyze hundreds of X-Ray and Computer Tomography (CT) images rapidly to speed up the diagnosis of medical image and help to contain them. Dental diseases analysis is among the most innovative research fields, offering diagnostic and decision-making facilities for a variety of diseases, such as oral and maxillofacial diseases. Inside this paper, we present a comparison of recent architectures of the Deep Convolutional Neural Network (DCNN) for the automatic classification of two diseases depending on transfer learning with fined tuned using a pre-trained network (VGG16, VGG19). The proposed work was tested using a small scale X-Ray panoramic dataset containing 116 images (58 ameloblastoma and 58 Complex Odontoma). As a result, we can assume that the pre-trained network (VGG19) demonstrates highly satisfactory results with a rate of increase in the accuracy of training and validation. Unlike CNN, pre-trained network (VGG16) demonstrates less performance when a small image dataset is available.
Keywords: Convolutional Neural Network (CNN), Deep Learning (DL), Transfer Learning (TL)

Selecting Best CPU frequency for energy saving in cluster using genetic algorithm

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Abstract

Dynamic voltage and frequency scaling (DVFS) is a technique mainly used for reducing the consumed energy of computer's processor. Its only drawback detracting the performance of parallel application when executing them over parallel platform. However, genetic algorithm is introduced and applied in a heterogeneous cluster architecture for modeling the best trade-off between the energy saving and performance degradation of the parallel application in the same time. The suggested algorithm selects the best frequencies vector to achieve that targets by offering equal trade-off between them. The genetic algorithm simultaneously gives minimum energy consumption and minimal performance degradation via its objective function. All experiment will apply using SimGrid simulator. The experiments show that the algorithm reduces the energy consumption of the message passing application by (24% with 8000 problem size and 22% for 4000 problem size) and in almost cases improve the application performance up to 3%.

Keywords: Genetic algorithm, heterogeneous cluster, frequency scaling, energy consumption

Internet of Things Based Drivers Safety Management

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Abstract

The vast majority of crashes are caused by the driver's negligence about wearing seatbelts while using electronic devices while on the road where the health about drivers rests in the driver's hands on the road. The aim of this article is to reduce the use of mobile devices while driving. This project was designed to ensure that the driver ties his seatbelts and also the mobile device is brought in silent mode before everything is determined for the drive. This can be done utilizing the Arduino controller which has been connected to the ESP8266 WiFi module, to detect the seat belt and the mobile Android service running in the back of the driver's mobile device. Mobile mode is switched from active mode to silent mode once Wi-Fi is turned off.

Keywords: ESP8266, PIC Microcontroller; Arduino Board, GSM Module, , Android Service; Seatbelt Checker.

A Comparison Study for Intelligent Wheelchair Based on MEMS Sensors

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Abstract— Today, the security of the system must be improved. A new approach is proposed that achievements the Integrated Circuit Metrics (ICMetric) technology to support identification of devices. ICMetric is a novel technology that generates the identification of devices based on the internal behavior of device features. In this paper, a comparative study is presented between two of our systems. These protection systems are designed to provide protection systems for intelligent wheelchairs. However, we proved that node identification can be provided by utilizing the three types of MEMS sensors. Extracted readings are acquired from the sensors and analyzed mathematically and statistically to provide an ICMetric basis that used to introduce identification of the device. Simulation results show that the proposed system can increase authentication and security.

Index Terms—*Security; MEMS sensor; ICMetric; intelligent wheelchair.*

Fuzzy Association Rule Classification System For Human DNA profile Identification

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ABSTRCT
Recently, numerous identification methods are adopted in human identification systems particularly for forensic affairs. These methods are used to reduce the human efforts, related errors, cost, and consumed time in addition to increase the accuracy of human identification systems. The definition of STR DNA profile of a person's, is associated to the reduction or detection of criminal investigation associated to the identification of the suspect, or to an investigation in counter terrorism as well as in the National Security Service. DNA is used for disaster victims or suspected individuals as a main means of identification. It possesses a high degree of verification in the courts when there is biological evidence, and is also used to identify persons accused and innocent people in criminal investigation with incredible accuracy. This thesis proposes a forensic human identification system based on Deoxyribonucleic Acid (DNA) classification. This system is depend on the concept of fuzzy logic and data mining in identification, that play role important in established a plenty of effective applications in DNA profile analysis and human identification, and reduce error or prevent and so they are chosen for their high accuracy. The main contribution of the presented system is, used association rules for classification the DNA motifs in addition to the fuzzy inference to correct errors, that can offer a high range of useful information. This information is permanently used to solve the crimes and identify damaged bodies. Additionally, this overcomes the lack problem in database information. It is important to note that the proposed system includes DNA based human identifications to cover all investigation cases. The aim of this thesis is to build a forensic human identification system that uses data mining techniques to access dataset by enforce particular algorithms for discovering advisable information or good patterns from present datasets for certain objective. To improve the data mining work, fuzzy logic is used to increase the flexibility for supporting DNA profile forensic human identification in making decisions. It utilizes sixteen Short Tandem Repeats (STRs) DNA loci used in identification methods for Population. It is important to note that the proposed system has been verified In terms of matching of provided samples with the samples stored in the database through conducting several experiments. The results were satisfactory and characterized by large percentage and high accuracy. Finally, performance of this system is evaluated and in turns the proposed system proves its capability in forensic human identification and scalability to handle huge amounts of data.

IOT SYSTEM TO LIMIT SPEED RATE BY USING GPS and RF DEVICES

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 ABSTRACT
Since automotive production has been concerned more with fast than ever. Therefore, vehicle accidents are steadily rising because of the increasing number of accidents due to the reckless high speed or caused by the increasing of road obstacles. So, these problems cannot be avoided as a result of that speed. Consequently, it is important to shape an auxiliary system to monitor the vehicles and calculate its speed as required using the GIS maps. These vehicles via messages know the parts covered by the speed reduction. The messages whether received from the controls planted in those zones or by the use of a GPS device to determine the vehicle's location, then it will decide to decrease the speed or not.

 Keywords: Internet of Thing (IOT), Engine Control Unit (ECU), Geographic Information System (GIS), Global Positioning System (GPS), Radio Frequency (RF)

Fingerprint Recognition

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Abstract: Fingerprint identification is one of the most popular and reliable personal biometric identification methods. This paper describes an is to characterize the fingerprint using Matlab 2010 program and is working on reading fingerprint then being on a set of processes to derive characteristics, (converting the image to the gray level and then to binary image and then process, one conformation processes where to find internal and external borders of the image (fingerprint) and filtered edges and find minutiae. fingerprint properties, which include the forest and the endings are segmenting the image into blocks 3 * 3 and extraction of whether these blocks contain end or fork and stored the coordinates of these characteristics in the two-dimensional matrix to coordinate the x and coordinate y and delete the undesirable characteristics and determine its direction because (it is likely that the match imprint in the coordinates of the fingerprint Although fingerprint different in terms of imprint direction) and then compare them with a database include a range of Fingerprint characteristics were extracted in the same way to recognition the existence or non-existence within this group .

Keywords -   Fingerprint, Thinning, Minutia, Ridge, Bifurcation, termination Edge Detection.

PROPOSED KNOWLEDGE MANAGEMENT CONCEPTUAL MODEL TO ENHANCE TEACHING ACTIVITIES THROUGHOUT WEB 2.0 TECHNOLOGY FOR ACADEMICIANS

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ABSTRACT
In the era of information technology, knowledge management became urgent need for raising the competitive advantage level. Universities considered as knowledge intensive base organizations. The knowledge are embedded in the academicians minds are sharing within students throughout various teaching activities. A valuable amount of knowledge that accumulated from academicians need to collected for sharing among the academicians community. The successful knowledge management processes of academician experiences lead to enhance the teaching activities. The learning process enhance by assisting academician to learn from each other and product high quality teaching activities. Most of academician's knowledge is faded due to the absence of standard system that could collect and share the teaching experiences. This research proposed knowledge management conceptual model that can enhance the knowledge processes of acquiring, storing, sharing, and reusing teaching experiences. Data collected by interviewing academicians from Iraq universities and obtaining the required data. The findings deployed to develop knowledge management model that could work efficiently and affectivity to enhance the teaching activities in Iraq University.

Prediction of Link Weight of bitcoin Network by Leveraging the Community Structure

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Abstract — In this work, the issue of predicting the edge weight in Bitcoin network has been addressed by leveraging community structure that involves members who trust with each other in their transactions. The proposed model consists of two main stages; the first one is the detection of trusted Bitcoin communities by implementing Newman-Girvan algorithm. In the context, the attributes of node have been modeling in different ways to get different structure of communities each time. Secondly, prediction the missing edge weight based on the neighbors of edge-source in community. In other words, the trust values that pointed to edge-target by neighbors are averaged to represent the prediction of missing edge weight. Practically, the model has been evaluated using two real-world datasets; Bitcoin-OTC and Bitcoin-Alpha datasets. The experimental results explicate the effectiveness of the proposed model comparable with other methods, where the minimization percentage for Bitcoin-OTC dataset is 4% and 18% for all and partial edges respectively. As for Bitcoin-Alpha dataset are 0% and 30% for all and partial edges respectively.

Keywords — Bitcoin network, Girvan-Newman algorithm, edge weight prediction, signed networks.

The GIS based Criminal Hotspot Analysis using DBSCAN Technique

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Abstract—Spatially Data mining used efficiently to extract any potential patterns and associations to detect hidden information from multiple sources data. In this paper, data mining Density-based spatial clustering of applications with noise DBSCAN algorithm is emphasised. The importance in this work was using a prototype software to process the giving data into an understandable outcome throw clustering technique, it is a powerful method for criminal activities detection and pattern recognition to get useful information that can help police to reduce crimes. Spatial data mining is practical with geographical crimes data set and processing a large amount of crimes data. Police conventional way was manual and time-consuming using a pin on the wall. Therefore, it has to be developed and merged with advanced techniques. In this study, data mining clustering method was used to examine Baltimore, Maryland's crimes information. The processed criminal data from the state of Maryland, Baltimore City was 340,924 cases and 16 attributes to reflect the cases between 2012-2018. DBSCAN algorithm is utilized to cluster crimes incidents focused on certain predefined events and the outcome of these clusters employed to find hotspots. The clustering findings are visualized by the GIS to make crimes distribution on the map at real-time for the law enforcement to understand and interact

Keywords—*component; Crime clustering; GIS; Pattern recognition; DBSCAN algorithm; spatial; temporal; Geospatial; Hotspot*

Saturation Component In HSB Color Space With Image Processing Methods To Enhanced Image Segmentation

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abstract

With the scientific advances witnessed by many branches of science, one of the most important of which is medical diagnosis, there is a role for digital image processing, a primary role that helps doctors increase the accuracy of the diagnosis, where diagnosis can be made through the coloring of one of the organs in the body with a specific color, indicating that this organ suffers from a specific disease, Likewise, the increase in the size of this organ or the smallness of its size are all indications of the injury of this organ with a specific disease. Therefore, it became necessary for the medical image to be highly visible. Also, the required member was taken out of the captured image. In the process of diagnosing the disease, therefore a method was presented in this paper that helps to improve the process of cutting any part of the image with high accuracy through the use of digital image processing techniques and reliance on the saturation layer in the HSB color system.

3D scenes semantic segmentation using deep learning based Survey

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Abstract
Semantic segmentation realization and understanding is a stringent task not just for computer vision but also in the researches of the sciences of earth, semantic segmentation decompose compound architectures in one elements, the most mutual object in a civil outside or inside senses must classified then reinforced with information meaning of all object, it's a method for labeling and clustering point cloud automatically. Three dimensions natural scenes classification need a point cloud dataset to representation data format as input, many challenge appeared with working of 3d data like: little number, resolution and accurate of three Dimensional dataset . Deep learning now is the power and popular tool for data and image processing in computer vision, used for many applications like "image recognition", "object detection", "semantic segmentation" , In this research paper, provide survey a background for many techniques designed to 3 Dimensions point cloud semantic segmentation in different domains on many several available free datasets and also making a comparison between these methods.
Keywords: point cloud, semantic segmentation, deep learning, and dataset.

Solving Software Project Scheduling Problem using Whale Optimization Algorithm

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ABSTRACT
In the software projects, one of the essential and difficult problems faced by the managers in the competitive software industry is the Software Project Scheduling Problem (SPSP). With the increase in employees and tasks' numbers the problem is becoming an NP-hard problem. The goal of this proposal is to resolve the problem of the software project scheduling with Whale optimization algorithm (WOA) and utilized it on various instances from three datasets. In order to prove the soundness and viability of Whale optimization algorithm (WOA), we illustrated some experimental results. This algorithm gave good outcomes for datasets that have a few tasks but failed to find feasible solutions when increasing the number of tasks.

Keywords: Project Management, Software Project Scheduling Problem, Whale optimization algorithm, Duration, Cost.

Using Digital Image as a Cover of Information Hiding: Review Paper

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Abstract
One of the most important topics that concern many researchers is how to make information that has a high degree of confidentiality hidden and not accessible except by the people who have the authority to view it, images are one of the most important multimedia that can be used as a cover to include the data, because the image contains how much A huge amount of data that can include confidential information in it, as well as the image is one of the most multimedia that is sent and received thus that the process of messaging with pictures does not arouse suspicion, this research provided a detailed study of a group of articles that used the image as a cover in the inclusion of information Confidentiality, and focus was on the most important domains of strength in each article. Articles were studied from 2013 to 2020 that were published at the containers of Scopes, and Google Scholar.

Key words: Steganography, Metric, PSNR, MSE, Q-factor, K-factor.

Engineering Papers

Contents

Numerical Investigation of the nanofluid mixed convection on two layers enclosure with rotating cylinder: High Darcy Number Effects

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Abstract. The present study, numerically investigated of mixed convection in a square enclosure with two layers, with Al_2O_3–water nanofluid (upper layer) and nano-porous medium (lower layer) with an adiabatic rotating circular cylinder at the center of the enclosure. The top and bottom walls are assumed adiabatic, while the left sidewall is heated, and the right sidewall kept cooled. Numerically, COMSOL code based on the Galerkin finite element method used for solved the dimensionless governing equations. The non-dimensional parameters that used in this study are: Rayleigh number (Ra) ranged from 10^3 up to 10^6, Darcy number (Da) equal to 10^{-3}, the angular rotational velocity (Ω) ranged (0 and 6000), the solid volume fraction (ϕ=0.06), and the inner circular cylinder radius as (R = 0.2). The results showed that when Rayleigh numbers increase, a noticeable increase in the flow intensity and the steep temperature gradient, while the values increase when the cylinder rotates. The value of the local Nusselt number was high in the upper half of the cavity. The effect of the cylinder rotates is greater on the value of the local Nusselt number when using the low Rayleigh Numbers.

Keywords: Nanofluid, porous media, mixed convection, rotating circular, counter-clockwise

Investigation of Cartesian Routing for Unmanned Aerial Vehicle Networks

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Abstract. Unmanned aerial vehicles (UAVs), commonly known as drones, are a pilotless aircraft that does not require any direct human intervention for flying. It can move autonomously based on its pre-programmed software, or can be remotely controlled. Besides its basic plane components, it also contains some computing devices and sensors for determining its position and for gathering information from the mission area. Flying Ad hoc Networks (FANET) are comprised of autonomous flying vehicles. It is a special case of mobile ad hoc networks (MANETs) characterized by a high degree of mobility. One of the most difficult and complex challenges facing FANETs is the routing process. To achieve this goal the Cartesian Orientation Protocol is used. The Cartesian routing protocol exploits geographic information for UAVs rather than using the address to direct packets to its destination. In this work, the most prominent algorithms based on geographic location has been highlighted that have been adapted to work in a three-dimensional environment and implemented in a common scenario and evaluated through several measures such as Packet Delivery Ratio, Path Dilation and End-to-End Delay.

Keywords: UAVs, FANETs, Cartesian routing, GPS

A Novel design of the solar central receiver to improve the performance of the central solar power tower plant

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Abstract. A novel design for a central receiver prototype was manufactured with dimensions of (50*50) cm staggered configuration using copper pipes of 9.5 mm diameter was tested to produce thermal energy from solar energy, had been analyzed numerically and experimentally. central solar tower receiver prototype was manufactured and mounted at Al-Nahrain University in Baghdad - Iraq, were high solar radiation is available. Heliostats with automated dual axes tracking systems were attained to capture the solar rays. Heliostats used to redirect the sun rays to a central receiver which is constructed using coated copper tubes to convert solar to heat and transfer it to the receiver working thermo-fluid.

According to a precise design consideration presented procedure in this study, a numerical and experimental investigation was performed. Also, an automated tracking system was installed on the heliostat to govern the title and azimuth movements.

The working fluid used is water. The supply tank was manufactured from plastic equipped with a digital flow meter to control flow rate to the receiver. In this study, a detailed layout, investigation for each part is shown. It's found that optimum tower height is 4.5m, optimum heliostat horizontal distance from the tower is 7m and the offset angle is 30°. Receiver thermal performance enhanced by 6.17% from the one-row receiver and about 12.98% for the evacuated tube receiver.

Keywords: *Solar energy, Central tower, Tracking system and Solar power plant.*

Numerical Investigation of the nanofluid mixed convection on two layers enclosure with rotating cylinder: High Darcy Number Effects

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Investigation of Cartesian Routing for Unmanned Aerial Vehicle Networks

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Investigation of Cartesian Routing for Unmanned Aerial Vehicle Networks

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A Novel design of the solar central receiver to improve the performance of the central solar power tower plant

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Prediction of Mechanical, Thermal and Electrical Properties of Wool/Glass Fiber based Hybrid Composites

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ABSTRACT

The mechanical, thermal and electrical properties of wool and glass fiber-reinforced epoxy-based hybrid composites were investigated experimentally. Three different types of the composite material were manufactured. The first type was plain woven glass fiber reinforced epoxy with 50% volume fraction. The second type consisted of natural fiber (Wool) reinforced epoxy with 50% volume fraction. The third type was hybrid natural wool and plain woven glass fiber reinforced epoxy with 50% volume fraction (25% fiber + 25% wool).

The results showed that the hybrid composite specimens have higher values of the tensile strength, modulus of elasticity and flexural strength compared with the wool specimens, while these values are less than that for glass fiber specimens. The values of the thermal conductivity and electrical conductivity are arranged in an ascending order as follows: wool/epoxy, wool-glass/epoxy, and glass/epoxy composites.

KEYWORD: hybrid fiber; tensile test; electrical conductivity

Autonomous Mobile Robot Navigation Based on PSO Algorithm with Inertia Weight Variants for Optimal Path Planning

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Abstract: Motion planning is an important domain since its performance can significantly affect the utilization of robots. This paper addresses our work to developing a path planner for wheeled a mobile robot using a swarm Intelligence technique for optimal path planning within a short computational time to get better path planning results. Through this technique, we developed particle swarm optimization (PSO) for generating fast and optimal path planning. Inertia weight technique is used for performance comparison of PSO Algorithms to get optimal path planning within a complex environment, PSO with a time-varying mechanism for the inertia weight values (TV-IWPSO), to analyze the performance proposed approach on the of PSO algorithm performance. Finally, the comparison has been done in between TV-IWPSO with both particle swarm optimization with constant inertia weight (B-PSO), and standard particle swarm optimization (S-PSO), in two different maps to performing analysis for algorithms through various environments. The simulation results, which carried out using Matlab 2018a showed that the PSO algorithm with inertia-weight strategy made good results for generating optimal path planning and efficiently than (S-PSO) and (B-PSO) in terms of path distance, execution-time

1. Keywords: Metaheuristic algorithm (PSO), Path Planning, Obstacle Avoidance, Mobile Robot.

Safe and Optimum Navigation of Wheeled Mobile Robot using Grey Wolf Optimization Algorithm

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Abstract. This paper discusses our research in developing a track planner for a mobile robot using a swarm intelligence technique for optimal track planning in a short computational time to achieve better results in track planning. Through this technique, we proposed grey wolf optimization (GWO) for generating fastest and optimal path planning. this paper introduces an algorithm for rapid and global motion preparation for a mobile robot in a complex environment with static obstacles. the performing analysis for GWO algorithm was evaluated in two different maps. Finally, A comparative study was evaluated between the algorithm built and the other algorithm exist, the simulation results, which carried out using Matlab 2018a showed that the GWO algorithm made results for generating optimal path planning and efficiently in terms of path distance, execution-time.

2. Keywords: Nature-Inspired Optimization Algorithm, Grey Wolf Optimizer, Path Planning, Obstacle Avoidance, Mobile Robot.

Efficient and Robust Filtering Method for Medical CT Images

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Abstract: This paper introduces a new approach to ensure the certainty of medical diagnosis by eliminating the salt-and-pepper noise (SPN) in medical applications for both gray and coloured computed tomography (CT) images. The proposed approach is based on median filter which utilized for value-preserving and edge-preserving in digital image

processing applications, Thus, the proposed approach is called improved adaptive median filter (IAMF). In contrast to the available research in the literature, the introduced method is characterized by the high filtering quality, robust in different noise intensities (low, medium and high) and computed efficiently. The obtained results of the filtering process have been analysed in terms of four main metrics: peak signal to noise ratio (PSNR), structure similarity (SSIM), universal image quality (UIQ) and filter average execution time (AET). The test scenarios were conducted using MATLAB 2019a running on Windows 10 computer. The success of the proposed filter has been validated by the statistical analysis based on the aforementioned metrics using gray and coloured medical CT images. For the worst case scenario in gray and coloured CT images when the noise intensity is 90%, the IAMF enhances the PSNR by 108-129%, the SSIM by 105-153% and the UIQ by 97-100% when they were compared to different filters that existed in the recent literature. These ratios depend on the image quality and image resolution. Moreover, the filter execution time has been improved by five times in gray scenarios and four times in coloured scenarios. Finally, the obtained results are visually verified as well.

Index Terms

Salt and Pepper Noise; Computed Tomography; CT Images; Median Filter; Non-Linear Filter.

Intelligent Controllers of Multiple Effect Evaporators via Simulation

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Abstract

This study deals with studying the dynamics and control of multiple effect evaporators by implementing two intelligent controllers for the evaporation of caustic soda. A mathematical model for evaporator is derived based on mass and energy balance. A dynamic model is designed using "MATLAB/Simulink" program based on the mathematical model derived. The intelligent controllers in this study are fuzzy and neural networks and compared with PID controller. The results showed that a good improvement for caustic soda system is achieved when the fuzzy logic with seven membership functions and neural predictive controllers are used because these methods have more suitable, lower over shoot, less offset value and less integral absolute error within range.

Keywords: Modeling of Evaporator; Fuzzy Logic Controller; Neural Networks Controller; PID Controller.

Experimental study of Wear Rate Behavior for Composite Materials under Hygrothermal Effect

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Abstract

The behavior of wear for composite materials with effect of hygrothermal was investigated experimentally. The pin-on-disc wear rig was manufacturing. The wear parameters, distance, humidity, applied load, temperature, and speed on the wear behavior was investigated. These composite materials consist of (fiberglass and polyester resin), with (40%) volume fraction. The results give the increasing of humidity and, or temperature causes increasing in glass-fiber/polyester composite's wear. Also, increasing the load, distance and sliding speed, will be led to an increase in the wear of glass fiber/polyester.

Key Words: composites, Hygrothermal, Wear.

The Effect of Water Mixing Temperature on Concrete Compressive Strength Containing Different Ratios of Silica Fume

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Abstract. This paper presents the experimental study about the effect of water mixing temperature on concrete compressive strength containing different ratios of silica fume by compressive testing of 108 cubes of (150×150×150) mm dimensions. The parameters were studied; temperature of water mixing, ratio of silica fume and age of test. The specimens were divided into four groups having different temperature of mixing water (20, 40, 60, and 80)° C, each group consisting of three set with different ratio of silica

fume (0%, 10%, and 20%), each set having nine cubes tested in a different age (7, 14, and 28 days). In fresh state, the results showed that different water temperatures give different values of slump when the percentage of silica fume is constant, where the slump value decrease by about (2-4) mm for each 20° C increase in temperature. Also, the slump of the concrete decrease about (5-10) mm at each replace 10% from weight of cement by silica fume. In hardened state, the greatest increase in compressive strength obtained at 40° C by about (20-30) % in compared with 20° C and then began to drop slightly at 60° C, but at a temperature of 80° C observed a great decrease in compressive strength. It is also found that as advanced the age of test, compression strength increases but rate of increase fall at high of temperatures due to early curing causing by high temperature of hydration. it was observed in this study when the water temperature increased above 60° C, the presence of SF resulted to decreasing in the concrete strength.

Keywords: Temperature water, compressive strength, concrete, silica fume, slump..

The effect of green roof on improving the environmental efficiency for the residential buildings in Baghdad city

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Abstract: Previous studies had proposed the environmental advantages of green roofs applications for the cities. This research investigated the effect of the green roof on improving the environmental efficiency for the residential buildings in Baghdad city as an example for hot aired climate. The research studied in practical applications of roof planting which represented by planting pots with Ficus plant on special desks designed contained the pots on the same type of traditional roof type, and compares it cooling loads and thermal properties with a traditional roof for a residential building. The results showed that cooling energy lost for green roof were lower in about 64% as compared to traditional roof. Also the recorded temperatures for the interior roof surface and the air temperature for the green roof were lower by 8 ℃ in summer months as compared to the traditional roof, while the green roof were moderate temperatures in about 3 ℃ for winter months.

Assessment of heavy metals and ecological risk in the sediments of Thi Qar and Basrah governorates - Southern Iraq

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Abstract. The distribution of heavy metals in surface sediment in the four sites of Thi Qar governorate and one site in the eastern part of Basrah governorate were investigated in order to detect the environmental characteristics in these areas. The texture of sandysilt, silt and sandymud are dominant in the study area. The distribution of heavy metals follows the pattern Fe> Ti> Mn > V >Cr > Zn> Pb >Ni >Cu > Co> As. The heavy metals content was reduced in the sandy sediments and low TOC. The heavy metals had a positive correlation with the silt fraction in the sediments of the study area. Sediments alkalinity found with a positive relationship with TOC content. The values of Fe, Zn, Pb, V, and Co were lower than their content in the world wild sedimentary rocks, while Ti, Mn, Ni, Cr, Cu, and As were higher than their content in the world wide sedimentary rocks. The spatial distribution of heavy metals is higher in the Majnoon oil field compared with the other areas. An approach utilizes various contamination indices (Enrichment Factor EF, Geoaccumulation index Igeo, Contamination Factor CF, and Ecological risks Er) were used to evaluate a contamination degree. The values of the contamination indices showed no/low sediment contamination with Co, Zn, Pb, Cu, V, Fe, and Mn in the Chibayish, Nasiriyah city center, and Tal Abu Dahab. Moderate contamination with Ti and Cr in the Suq Al-Shuyukh ,Majnoon oil field and Chibayish, while considerable contamination with Ni and As in the Majnoon oil field. The results of Er showed low heavy metals ecological risks.

Keywords: Majnnon, Iraq, Thi Qar, Basrah, Heavy metals, Tal Abu Dahab

Improve and reduce the economic cost and pollutants of a swirl burner

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ABSTRACT. The Arab Gulf region is rich in oil products, as Iraq is the second largest country in the Gulf with oil reserves, as Iraq exports to the world 3,500,000 million barrels per day, thus oil is the main source of energy production. However, the main challenges facing energy developers are efficiency, pollution and the economy. Therefore, this paper focused on pollution problems associated with combustion operations as well as economic costs by changing the type of fuel from diesel to liquefied petroleum gas and modifying the system to raise its efficiency and reduce emissions and cost, by setting a vane guide to make swirl fluid with a strong and coherent structure and thus a near perfect ideal few Emission of greenhouse gases at an acceptable cost compared to diesel fuel, where the economic side of the system was highlighted in terms of excessive fuel consumption, as diesel fuel consumption for the system during the whole working hour reached 24,000 Iraqi dinars, while fuel consumption with LPG reached 15,600 Iraqi dinars, thus saving 8,400 Iraqi dinars Thus, fuel consumption was reduced by 0.35%. Consequently, the improved fuel economy and environmental considerations of the external combustion system make it a sustainable choice in the energy field such as industries, power stations and all other fields.

Keywords: Equivalence ratio, Reduce pollutants, Reduce cost , Swirl burner .

Improving Operational Efficiency of Government using Artificial Intelligence

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Abstract

In this paper we developed a technique for Improving the operational efficiency of the government using Artificial Intelligence, we discussed the concept of insurance and how the concept of insurance will change and Artificial Intelligence (AI) is already disrupting the state of this industry. Insurers worldwide are using AI to automatize processes and tasks, such as fraud detection, underwriting, and claims processing. Additionally, there has been a rise of new competitors in the market, such as InsurTechs, that are bringing innovative solutions for insurance using Artificial neural network (ANN), responding to the new trends in customers' lifestyles and behaviors, that are more demanding for services directed for their needs. This study aims to understand how personalization of insurance policies, created with Artificial Intelligence and how its efficiency can be improved, and how it will disrupt this industry in the future and what will be the impact on the government's operational efficiency. We have chosen worldwide Governance indicator dataset which is publically available the personalization of an insurance policy with AI would encompass the definition of the coverages and premiums more appropriate for an individual customer and do the risk evaluation, in a market of one strategy. This innovation would take advantage of the accrual of Big Data from customers for the optimization, as people are each time more connected and information about them is constantly being shared, allowing companies to use it to know consumers better and for the training, testing and validation a well-known MATLAB R2019a software was used for this purpose. We achieved an accuracy of 95.25% using 9-Fold cross-validation.

Keywords: Artificial Intelligence, ANN, Big Data, optimization.

Study of Iraqi Smart grid

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Abstract

With the development of electronics and communications and to be conveyed with that development and the importance of smart grid, in this research a study of the generation domain with smart technologies is used. Also the renewable energy used as an alternative energy with controller by using a programmable card to control and improve power efficiency of generation by increasing energy generation to match the population increases and requirements.A smart grid (SG), which is also called a power grid or smart electrical grid proposed for stability enhancement and as a solution to generate more energy to meet the increase in demand for power generation, as abbreviations it couldn't specify by one tool or one part of electrical grid where there are many methods to achieve the goal of the smart grid, but this paper aims to present a generation part with smart techniques. Recently, it was heading to rely on renewable energies as an alternative energy because it is a clean source to generate energy and available source, and since research has proven the efficiency of solar energy in Iraq more than wind energy, the solar source suggested as an alternative source for energy generation.

Keywords: Smart grid**,** Back Propagation Neural Network, Field Programmable Gate Array.

EXPERIMENTAL INVESTIGATION OF THE FLAME STABILITY MAP (OPERATING WINDOW) BY USING A TANGENTIAL SWIRL BURNER FOR THE CONFINEMENT AND UNCONFINEMENT SPACE

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ABSTRACT

Despite the development in the field of energy usage and the ways to reach it to meet the needs of human life, the energy is the actual measure of development in any society. The hydrocarbons fuel is the main energy source in the world and the increments in consumption hydrocarbons lead to an increase in the pollutants and increase global warming. To obtain economical combustion systems that have more stable, the present work used a new design for LPG tangential swirl burner to clarify the extent of the combustion stability for with and without confinement space (flashback, and blowoff). Moreover, study the produced heating power for both confinements and without confinement. The experiments were performed with four constant values of gas (2, 4, 8, and 10) L/min at different airflow rates for individual gas value. The results demonstrated that the flame stability behavior of the confinement burner was clear when Φ verify from 0.39 to 1.4, while without confinement the flame stability was clear when verifying from 0.34 to 1.7. For the same operation parameters the values of heating input (2.63, 6.56, 10.55, and 13.19) kW.

Keywords: *Burner, Blowoff, Confinement, Flashback, Operation window, LPG*

Heat Transfer and Fluid Flow Over a Bank of Circular Tubes Heat Exchanger Using Nanofluids: CFD Simulation

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Abstract: In the present work, the influence of the basefluids and nanoparticle types on the fluid flow and the heat transfer behavior were studied. Numerical investigation has been done over a bank of tubes heat exchanger in a triangular arrangement. Turbulent forced convection of Al_2O_3 and SiO_2 nanoparticles-based water and glycerin nanofluids was predicted, spherical nanoparticles with a diameter of 30 nm and a volume fraction of 3% were assumed in this simulation. Commercial software so called Ansys fluent used as a computational fluid dynamics code to solve steady (2-D) Navier-Stokes and energy equations adopting finite volume techniques. The k-ε model was used to modelling the effect of turbulent. The obtained results demonstrated that the heat transfer for SiO_2 nanoparticles based deionized water nanofluids was higher than the other types of nanofluids, which means that this working fluid could be promising cooling liquid in many heat exchange systems. The friction coefficient for all nanofluids reduced with increasing Reynolds number for all tubes. Furthermore, the results showed that the heat transfer enhancement increased with increasing the Reynolds number in all nanofluids with constant volume concentration and nanoparticles size.

Keywords: Nanofluids, Heat Transfer, Glycerine, Al_2O_3 and SiO_2 nanoparticles.

Monitoring of Water Surface Change of Haditha Dam's Lake Using Satellite Data Technique

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Abstract

Water bodies in Iraq and other countries are considered the essential key for human life as they play a large and influential role in the country's economy. Thus, the strategic plans of water management must be developed according to the need for future requirements. The current study aims to monitor the change in the water surface area of Haditha Dam Lake by calculating the surface area of the lake over a sequential time (1985-2019). GIS and Satellite imagery techniques were used to achieve the goal of the study. Landsat Space Archive was used with its fifth, seventh and eighth categories according to Path 170 / Row 36. The results showed that the lake generated from the dam was tested by three main stages. The first stage (1985-1988), the second stage (1988-2000) and third stage (2000-2019). The study presented that the average area of the Haditha dam Lak for the period 2001-2016 was 313 km^2, compared to the average area of 418 km^2 for the period 1988-2000, which means that the difference in the average surface area decreased by 25%. The Maximum and minimum water surface areas were about 427 km^2 and 148 km^2 for 2014 and 2015 respectively throughout the period time of 1988 to 2019. The declination behaviour of the surface area was observed from 1988 t0 2019 for the general trend line with a slope of 11.8.

Simulation of Dewatering System in A Mine Shaft Using A Prototype Model Driving by Arduino Microprocessor

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Abstract

Dewatering is a process which is related to water removing from the excavation worksite during mining. In this research, a prototype model of shaft mine has been fabricated and the system is simulated using ultra sonic sensors and ARDUINOUNO microprocessor and a control monitor has been built by LABVIEW software to drive the system. Horizontal slice Method has been applied in calculations of water level. An extensive tests are carried out by measuring the water level inside the mine shaft and is compared to predicted data from the system. The recorded error is 0.22 % of the whole tank capacity at full load condition. A desired water level is calculated based on the desired time and this one is compared to the speed of sound with an interesting result of average error 0.00036s in time. This mechanism is absolutely passed with no modification and it has a flexibility to apply in various industrial aspects efficiently with low cost.

Keywords: Water Level, Horizontal Slice Method, Arduino, Labview, Dewatering, Mine shaft

Study the consumption and cost of using LPG in diesel engines

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Abstract

Diesel fuel used in diesel engines is more expensive than other fuels used in internal combustion engines and causes emissions that affect the environment and health. The researchers have established the possibility of providing fuel that operates in diesel engines and that is less expensive and pollution than diesel fuel. Iraq is one of the oil and natural gas producing countries, the choice of LPG makes the choice available because of the positives it possesses, which are low price, high thermal value and the possibility of mixing with air easily and low emissions, it is considered environmentally friendly and also maintains the engine as it does not contain high sulfur compared to diesel fuel.

The Electronic Control Unit (ECU) designed a new and used to adjust the injection of LPG timing and duration while opening the air intake valve into the combustion chamber and a magnetic sensor is installed on top of a single-cylinder diesel engine with air cooled. The test engine was operated with as D-100 and LPG-50. The diesel quantity was changed by is flow rates of injectors 100% and 50% and replaced by LPG .The test was for each condition load 0%, 25%, 50%, 75% and 100% at different speeds 1000,1500 and 2000 RPM.The best case for BSFC is when the engine is running in dual fuel mode and at 1000 RPM , where the fuel improves by 9.81%. decreased that per hour running cost per liter of dual fuel compared to pure diesel fuel at speeds 1000, 1500 and 2000 RPM by 14.45%, 15% and 15.31% respectively.

Keywords: *Diesel Fuel, Dual Fuel, Diesel Engine, LPG Fuel*

Using Distance Learning Programs as Instructional Technology in Architectural Engineering. Case study-Teaching Staff of Architectural Engineering Department, Alnahrain University

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Abstract. This study aimed primarily to identify the current reality of using instructional technology, especially distance learning programs, in Architectural Engineering Department, Alnahrain University, where the distance learning system was adopted in the course of all study syllabuses at all levels, after it become difficult to go to the universities. In order to complete the classroom requirements - given that Iraq and all countries of the world are included in the curfew due to the outbreak of COVID-19 virus -, and in order to learn about the reality of this experience, which is using the distance learning programs as instructional technology in architecture, the researcher has designed a questionnaire to identify the reality of this experience. After verifying the validity and stability of this questionnaire, the researcher distributed it to respondents from all levels. The researcher used the descriptive and analytical approach, and then he followed many statistical processing such as (T) test, Pearson correlation coefficient and one- way analysis of variance for analyzing the data. The researcher has found out many results, most notably: -The research showed that the distinctive feature of the level professors' views is negative regarding the use of instructional technology in distance learning programs.Finally, the research concluded a number of recommendations and proposals that help to address the research problem, and shed more light on it.

Key Words: [Distance learning, Architectural Engineering]

Numerical and experimental analysis of effect of working fluid amount on the thermal performance of thermo-syphon system

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Abstract

The thermal performance enhancement of a thermo-syphon system has been studied by many researchers. However, according to the best knowledge of the authors, the impact of the amount of the working fluid on the performance of thermo-syphon has not hitherto been studied. In the present work the impact of inserting a closed tube inside the riser pipe and effect of increase and decrease the amount of the working fluid on the thermal performance have been investigated. Several cases have been considered and tested. To ensure the validity of the theoretical results, an experimental work has been conducted and results compared with numerical results. The results show good match between numerical and experimental results. In particular, the maximum difference between experimental and numerical results is found 14.52% and 11.23% for water temperature inside tank and working fluid at outlet of the riser pipe respectively. As well as, the numerical results have been demonstrated that the amount of the working fluid within the thermos-syphon loop has a noticeable impact on the thermal performance of the regarding system. Furthermore, it is found that the (case-A-) is the best case among all cases under consideration regarding system the thermal performance of thermos-syphon. Moreover, a correlation equation to predict water temperature within the storage tank has been established. The accuracy of this equation around 95.6%.

Keywords: Natural Convection, Thermo-syphon, Thermal Conversion Computational Fluid Dynamics (CFD), Amount of Working Fluid.

Optimization of Steel Trapezoidal Box-Girders Using Genetic Algorithm

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Abstract:

The goal of the structural design is to select sizes of member with an optimum proportion of the overall structural geometry in order to achieve the lowest initial cost design. Traditional steel box-girders, generally made of two plate flanges, two webs and a number of internal diaphragms, were used in many different fields, such as the structural, architectonical and bridge engineering industries. This study aims to establish a three-dimensional finite element model to minimize the total volume of a steel trapezoidal box-girders. The finite element ANSYS program package was used to determine the optimum total volume of the steel trapezoidal box- girder. ANSYS program has been coupled to MATLAB software. The genetic algorithm method of optimization is considered. In this analysis, the objective function is the total volume minimization. The design variables are the top flange width, bottom flange width, top flange thickness, bottom flange thickness, web height and web thickness. The constraints in this study include normal stress, shear stress and the displacement. The results of optimization for box-girder show a reduction in the total volume of a steel trapezoidal box-girder of about 38%.

Keywords: finite element; ANSYS; optimization; trapezoidal; steel girder; genetic algorithm.

Removal of TOC from oily wastewater by electrocoagulation technology

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Abstract

The present study aims to employ an electrocoagulation reactor containing concentric-aluminum-tubes as electrodes for total organic carbon (TOC) removal from real oily wastewater released from drilling sites located in West Qurna-Iraq. Applied current ranges from 0.5 to 2.0 Amps and contact time ranges from 10 to 40 min had selected as the operational variables. Response surface methodology (RSM) type central composite design (CCD) and MINITAB-statistical soft program had performed to design experiments and analysis of the obtained results. The results showed significant removal of TOC (83.91%) at the optimal values of the operational parameters (1.606 Amps and 40 min). Moreover, the present design of the electrocoagulation reactor was more reliable and cost-effective that could be used in practice efficiently.

Keywords: Real oily wastewater; TOC; Electrocoagulation reactor; RSM-CCD; Optimization.

Structure parameter effects of PCF on dispersion for single-mode regime based on V-parameter

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Abstract

In this paper, the dispersion of photonic crystal fiber (PCF) with five rings hexagonal geometry have investigated by varying different parameters. Many researchers had used small size of fiber (small pitch distance) to ensure the single mode operation but decreasing the pitch distance leads to increasing the dispersion. It is important to get suitable pitch distance so that it is not large to avoid the multimode operation and not small to avoid high dispersion. In this work, this condition has obtained depended on V-parameter. We have estimated the V-parameter by using the step-index fiber approximation. The Pitch distance which has been obtained is 5 um with low dispersion and low V-parameter $\leq$ 2.405 (single mode operation). In addition, to get more low dispersion and V-parameter, a doping with two different value of Ge (4.1% and 7%) has been applied in core.

Developing Sustainability Measurement Tool for University of Babylon

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Abstract

In the last few decades, there have been increasing in assessing sustainability for industrial originations worldwide. The educational institution stared to adopt these principles as it is considering a large platform to start with. Narrowing down to the Iraqi educational institutions, there are still frustrating with applying the sustainability concept at the universities. Therefore, a developed tool to assess the current sustainability situation was conducted. Based on the analyzing by using Prism software after a year of gathering data, there was a significant issue with all the 15 indicators. The indicators broke down into Transportation, Educations and Research, Recycling Systems, Green Buildings as well as Water and Wastewater. The developed sustainability assessment tool is beneficial for any other university that willing to take a part in this principle with continuous measuring should be monitored.

Keywords: Sustainability Tool, Babylon University**,** Iraq.

Detection of vehicle with Infrared images in Road Traffic using YOLO computational mechanism

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Abstract

Vehicle counting is an important process in the estimation of road traffic density to evaluate the traffic conditions in intelligent transportation systems. With increased use of cameras in urban centers and transportation systems, surveillance videos have become central sources of data. Vehicle detection is one of the essential uses of object detection in intelligent transport systems. Object detection aims at extracting certain vehicle-related information from videos and pictures containing vehicles. This form of information collection in intelligent systems is faced with low detection accuracy, inaccuracy in vehicle type detection, slow processing speeds. In this research, we propose a vehicle detection system from infrared images using YOLO (You Look Only Once) computational mechanism. The YOLO mechanism can apply different machine or deep learning algorithms for accurate vehicle type detection. In this study we propose an infrared based technique to combine with YOLO for vehicle detection in traffic. This method will be compared with a machine learning technique of K-means++ clustering algorithm, a deep learning mechanism of multitarget detection and infrared imagery using convolutional neutral network

Keywords: Infrared, YOLO, intelligent transport system, spatial resolution, detection

Mitigation of Harmonic Distortion of AC Voltage of the Source Caused by DC Drives commutation Notches.

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Abstract: The wide use of power electronics in speed control of DC drives creates commutation notches in AC supply voltage of the source. In this paper a standalone generator of 150 KVA is feeding a variable speed DC drives of 75 KW is studied and a single tuned passive filter is designed to mitigate the notches in supply voltage to be compliance with IEEE Std519:2014.

The effect of residential building façade design on energy consumption for hot desert climate

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Abstract: One of the most prominent parts of the building envelop that exposed to the external environment is the facade of building due to the pressure of environmental conditions as compare to the rest of building. Previous literatures had presented many researches in this field, but the study of the effect of the residential building façade design in reducing the energy consumption of buildings had not been adequately addressed for hot desert climate. The aim of this research is to determine the design characters for the façade of residential buildings. That includes wall materials, window to wall ratio, and the shape of windows, that reduce energy consumption in summer session. To achieve this goal, a typical type of two stories residential building had been adopted and tested by software simulation program to estimate the energy performance. The results showed that most efficient materials for the façade were the thermostone block with brick claddings. As for orientation the best results was for north elevation. And for window to wall ratio the best value was 20%.

Removal of Methylene Blue Dye from Aqueous Solution Using Kaolin

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Abstract. Freshwater resources were suffered from the pollution problems that resulted from pollutants of industries such as dyes and colourants. This study utilised a natural adsorbent, kaolin clay to remove pollutants' dye (Methylene Blue) from aqueous solutions. Batch studies were conducted to evaluate the adsorption efficiency for dye removal from aqueous solution under varying conditions such as initial pH (pH), contact time, initial dye concentration on adsorption of dye. The optimum pH was found to be 6. The investigations in this study showed that 83% of dye removal can be achieved at the first 50th min. Meanwhile, 60 min was enough to reach the equilibrium state. Additionally, the results revealed that 100 mg/l of kaolin can lead to increase the 83 mg/g of adsorbed dye amount. The maximum removal was 89 % when the quantity of kaolin dosage increased to be 1.5 g. To sum up it, using kaolin as adsorbent material showed high efficiency to remove the dye which can be another addition for serious water pollution treatment efforts

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A Review: Asynchronous Counters Using Quantum Gates

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Abstract

The major trouble at present time technology is the information loss due to high technology circuits and system designed using irreversible hardware, to solve this problem used quantum gate. The prime purposed of designing quantum gate to reduce power consumption, decrease quantum cost, delay, number of garbage outputs. Quantum gate requires non-demolition of information, Therefore the number of inputs must be similar to the number of outputs. This paper presents a review of the asynchronous counter designed by T flip-flop and comparing with existing.

Keyword: quantum gate, T flip-flop, asynchronous counter, garbage output, quantum cost.

Performance of Artificial Neural Networks (ANN) At Transportation Planning Model

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Abstract.

This study based on Artificial Neural Networks (ANN) in modeling trip production , which represent the first stage at transportation planning. The study analyzed the performance of ANN based on data that collected for central business district (CBD) of the city of Nasiriyah by calculating the all trips (y) that produced from this sector. As results, The ANN model gave a high performance comparative with Statistical Techniques in predicting trips. The coefficient of determination R² for the number of all trips (y) is (0.948) and (0.871) for ANN and Statistical Techniques approaches respectively which is considered as an acceptable relationship obtained; also the ANN prediction model is more accurate for prediction process.

Keywords: Transportation planning , Model, Artificial Neural Network and trip production ,

Structural behaviour of concrete beams reinforced with polyethylene terephthalate (PET) bottles wastes bars

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A B S T R A C T
This paper examines the effect of using PET bottle waste as a reinforcement bar in concrete beams. Waste of PET bottles has been cut by a special tool to long strips with width of 6 mm and thickness of 0.5 mm and lengths ranging between 6000 mm for small bottles and 11000 for large bottles. Then, straps areused in the formation of PET bars in three different forms, two braids are formed and twisted bundles form.Each PET bar consists of 36 straps. PET bars are arranged in the same location of rebar as an alternative to the steel bars in the tensile area. Also, it are pre-tightened before casting with a special tool is designedfor this purpose in order to give it a straight texture and reduce the expected elongation. Five concrete beams with dimensions (150*200*1400)mm are used in this study.Two of themare controlledbeams with and witout tension steel reinforcement.The other three beams are reinforced withthree different forms of PET bottle waste bars. The achieved results are encouraged and unprecedented as the models containing rods achieved a maximum failure load of up to 25% of the failure load for specimens containing reinforcing steel bars.This technique enhancesits ability to be used as reinforcing bars in secondary structural members.

Epistemology and Creativity in Architecture

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Abstract
General visions in the architectural field shared many concepts. There are numerous indicators for dealing with these concepts, in addition to communicating with deeper areas that formed a source for scientific addition to them. Epistemology is one of these concepts that represent a necessary and essential field and has a fundamental value of knowledge. Epistemology can represent an intellectual expansion to any other field. Therefore, the scope for this study was to investigate influence of that field through its basic concept (epistemology), with common implicit idea of architecture, in addition to clarifying the state of relationship between the two main terms of the research.

This research aims to define and study the general frameworks of basic research concepts of epistemology and creativity and their interconnections within architectural propositions to identify their fundamental indicators within a specific theoretical framework that is formed for this purpose after proposing the research problem. The research problem was represented by the weak clarity of cognitive perception correlation between the concepts of epistemology and creativity, and impact of this correlation in architecture, up to applying the terms and indicators of the theoretical framework to an elected and specific architectural product, and then to present, analyze, and discuss the results of that application, reaching to final conclusions. The outcomes have revealed the significant influence of the indicators of general conceptual frameworks for the epistemology relationship with creativity versus the more substantial impact of interactive and detailed structures for that relationship.

Keywords: Knowledge, Epistemology, Creativity, Architecture .

Diagnosis of Lung Cancer Based on CT Scans Using CNN

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ABSTRACT

Lung cancer is one of the most lethal cancer types; thousands of peoples are infected with this type of cancer, and if they do not discover it in the early stages of the disease, then the chance of surviving of the patient will be very poor. For the suggested reasons above and to help in overcoming this terrible, early diagnosis with the assistance of artificial intelligence procedures most needed. Through this research, a Computer-aided system introduced for detecting lung cancer in a dataset collected from the Iraqi hospitals by using a convolutional neural network technique with AlexNet architecture for helping with the diagnosis of the patient's cases: normal, benign, or malignant. The proposed model gives high accuracy ups to 93.548%. The other performance metrics comes with high values such as 95.714% for sensitivity and 95% for Specificity.

Key words: lung cancer, Convolutional neural network, CAD System, Artificial intelligence

Fresh and hardened properties of self-compacting high performance concrete containing nano-metakaolin as a partial replacement

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ABSTRACT

In this study, the effect of partial substitution of cement material with nano-materials represented by nano-metakaolin(NMK) has been studied on the fresh and hardening properties of High-Performance Self-Compacting concrete (SCHPC), where the substitution was made in different proportions, namely (1.25, 2.5 and 3.75). Four mixtures were made, the first reference and the remaining three mixtures in which the cement was partially replaced by the above mentioned proportions. Fresh characteristics represented by the Slump flow, T_{50} c m, the L- box and the V- funnel were studied. As for the hardening properties, the compression and tensile strengths were examined. We observed through practical results that the Slump flow and L- box values decrease as the percentage of partial substitution of cement to nano-metakaolin increases. Whereas, T_{50} cm and T v It increases with the increase in the partial substitution rate for cement with nano-metakaolin. As for compressive strength and tensile strength, it increases with the increase in the percentage of partial replacement of cement with nano-metakaolin.

Keywords: Nano metakaolin, Self Compacting High Performance Concrete, Fresh and Hardened Properties.

The Use of Spreadsheets in Teaching the Economic Load Dispatch Problem

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Abstract:
Economic Load Dispatch problems in electrical power networks have been investigated over the years and several calculation methods were introduced. In order to determine the work state of power network, it is often necessary to solve a large system of non-linear transcendent equations. Therefore, the program routines are complex to develop, while specialized commercial software packages are expensive and not easily available. On the other hand, Microsoft Excel as a part of Microsoft office software package is widely spread in the world and relatively easily available. This paper presents the design and development of Microsoft Excel based economic load dispatch analysis tool and its application for system planning and operation. Three different economic load dispatch methods, namely, Merit Order, Lambda-Iteration and Dynamic Programming methods have been implemented to provide wider choice for the users. The emphasis of this paper is on the educational value of spreadsheets in the analysis of power system.
Keywords: Economic Dispatch, Equal Incremental Cost, Modified Lambda Iteration, Dynamic Programming, Merit-Order

CFD Simulation of Velocity Distribution in a River with a Bend Cross Section and a Cubic Bed Roughness Shape

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Abstract: The variation of bed roughness along a channel cross section especially if the cross section with bend affects the velocities in that part of the section may be used to change the flow patterns in the channel and as a mean of river training. In this research the Computational Fluid Dynamics (CFD) for modelling the effect of bed roughness on the free surface flows in open channel has been validated for a straight river, the effect of angles of attack downstream the bed roughness has been investigated. This study presents the results and analysis of numerical simulations that were carried out to compute Manning's coefficient of artificial geometric roughness element (cubic shape). Artificial roughness elements were fixed on bed of the flume within the test section in different spacing and angles of attack. A sequence of CFD simulations using the k-ω SST model are compared with a set of laboratory data for the influence of flow at a free surface in open channel with cubic shape bed roughness. The numerical results gaining confidence in a modelling of Volume of Fluid (VOF) technique and allows for modelling of more complex hydraulic structures by including the effect of angles of attack to the simulation.

Keywords: Manning's coefficient, angle of attack, bed roughness, CFD.

Measurement of the density and the composition of the upper atmosphere by the Electron-Ion trap sensor

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Abstract- This article explains the design of the electron-ion trap sensor for measuring the density and the composition of the upper atmosphere. The simulation of the electric field between the trap electrodes and the charged particles motion in it is carried out. The calculation of the maximum energy and speed of the particles below which the trap holds all charged particles, even in the case of the most unfavorable direction of their speed-along the gap between the electrodes. It is shown that this critical energy does not depend on the mass of the particle, and the probability of charged particles passage with an energy more than the critical energy through the trap is estimated [1].

Keywords: numerical analysis, vacuum gauge converter, ionization, mathematical model, experiment.

Methods of Improving the Performance of Adsorption Thermophysical battery based on the Operating Conditions and Structure: A Review

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Abstract: Methods of improving the performance parameters of the adsorption thermophysical battery (ATB) including, coefficient of performance (COP), specific cooling power (SCP) have been reviewed in this study. Adsorption thermophysical battery has received much attention in the last few decades due to its advantages in utilizing waste heat or solar energy and using environment-friendly refrigerants. This survey reviews 158 papers that propose method and technologies to improve ATB. Structures and operating conditions such as heat exchanger, solar collector, fins, heat and mass transfer, adsorbent-adsorbate working pairs are discussed in this review. It was collected from the review literature: (i) cooling capacity and COP are increased with hot water temperature increasing and with reduction of inlet cooling water temperature, (ii) the condensation temperature is inversely proportional with COP and SCP for single and double stages ATB, (iii) both SCP and COP are increased when the heat source is a relatively high temperature; (iv) operating cycle time is important to achieve the optimal system performance, where the COP increases with cycle time increasing for particular limits. (iv) novel adsorbent materials such as MOF can significantly improve the ATB performance, (v) enhancement in cooling capacity of the ATB can be achieved under high flow rates of hot and cold water, (vi) improving the adsorbent thermal conductivity can enhance the performance. This review can assist in selecting the ATB for future research works with improved COP and reduced cost when this system is driven by waste heat or solar energy.

Keywords: Adsorption thermophysical battery; performance; working pairs; thermal energy storage; structures; operating conditions.

Emissions Investigating of Carbon Dioxide Generated by the Iraqi Cement Industry

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Abstract

The most used material in the world after water is concrete, which depends mainly on its manufacture of cement leading to the emission of carbon dioxide (CO_2), flying dust, and other greenhouse gasses (GHGs) resulting in pollution of the atmosphere. The emission of CO_2 from cement production is approximately 5% of the global anthropogenic CO_2. This research focuses on investigating the amount of CO_2 emission from the Iraqi General Cement Company plants includes the cement factories of Kirkuk, Al-Qa'em, Fallujah, and Kubaisa, using the GHGs Protocol Measures Program (specifically cement based-method). The data required for cement production was provided by the Iraqi Ministry of Industry and Minerals throughout 25 years. The results showed that the largest amount of CO_2 emissions cumulatively over 25 years was from the Kubaisa plant with an average emission amount of approximately 7,613,605 tons/25 years. While the lowest cumulative amount of emission was by Fallujah cement plant represented by about 868,341 tons/25 years. On the other hand, the highest and lowest production amount was from Kubaisa and Fallujah plants at 105% and 0.6% in 1989 and 2008 respectively relative to the design capacity. Shifting to renewable and clean energies that limit the amount of CO_2 emitted to the atmosphere is highly recommended, although this requires facing problematic challenges.

Keywords: Carbon dioxide; emission; atmosphere, cement industry

Codigestion of Food Waste with Used Lipids as Substrate Material to Produce Biogas

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Abstract

Anaerobic co-digestion of food wastes process is represents an active technique to enhance the production of biogas as one of the clean energy sources. The effects of adding lipids as substrate material to the food waste mixture for producing biogas by anaerobic co-digestion are experimentally investigated and evaluated at various mixing ratios in the present work. The influence of lipids and food waste (potatoes, tomato, Carrots, Cellulose) mixing ratios, digestion time and other factors on production of the biogas and CH4, CO2 and H_2S percent are investigated experimentally. Seven samples of substrate mixtures (used edible oil, waste food, cow dung and water) with various mixing ratios were tested during 32 days as digestion period to investigate the influence of lipids percent compared to food waste on biogas yield. The results show that, average biogas production was in range of 100-160 ml per day and the maximum percent of Ch_4 and CO_2 were 52% and 46% respectively for the produced biogas. Increasing the lipids percent in the substrates mixture could enhanced the biogas and CH_4 production. The mixing sample containing 70% lipids and 30% food waste percent was produced significantly higher biogas and CH_4 yields compared to the other mixing samples. Best digestion time of the food waste-lipid mixtures was observed in range of 12-16 days for the tested samples. The maximum cumulative biogas was 5120 ml which was produced by substrate mixture (70% lipid and 30% solid waste) during digestion time 32 days.

Keywords: Biogas, Co-digestion, Food Waste, Lipids, Anaerobic

Study of Two Layers Horizontal Ground Heat Exchanger Performance Under a Different Operation Mode.

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Abstract

This paper presents the thermal performance of two-layer horizontal ground heat exchanger at various mass flow rates of water in cooling mode of alternating and continuous operations. Multi-layer composite pipe (MLC) was chosen as the ground heat exchanger tube material. Effects of mass flow rate variation and mode of operations on ground heat exchanger (GHE) performance are discussed. For this purpose, two-layer experimental GHE was fabricated. In alternative operation mode, heat exchange rate was always higher than continues operation mode in GHE. The outcomes achieved from this experimental investigation are utilized to measure the COP of the GHEs. The experimental results showed that the COP values at the alternating operation mode and after six hrs of operation period were ranged from 2.48 at 0.5 ℓ/min to 8.17 at 3 ℓ/min. While in continuous mode, the COP values ranged from 2.28 at 0.5 ℓ/min to 7.37 at 3 ℓ/min. The results also revealed that the GHEs can be used in cooling applications as ground source heat pump system in Iraq that is considered as a hot weather country.

Keywords: Geothermal heat exchanger, COP of: geothermal heat exchanger, Alternating operation mode for GHE.

Wind Distribution Map of Iraq - A Comparative Study

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Abstract

Wind speed data of 10m in height for 11 meteorological station in Iraq has been studied, to understand and determine the distribution of wind speed. Wind speed values is increased when we go toward the southern region of Iraq because the flatness of the ground surface. The sites of Basrah, Nasiriya and Hai were the best with respect to wind speed, especially, at summer.   These sites have an annual average values of wind speed of about 5m/s and more. A good similarity obtained when comparing the prepared wind map of the annual average wind speed, with the wind map of Iraq that produced by the National Renewable Energy Centre of Spain (CENER). This similarity demonstrates the reliability of the local data used in this paper, which means it is certified and a good source for the researchers in the site assessment. Also, this data is useful to the decision maker when he decide to install wind turbine or establish wind farm to generate electric power .

Keywords : Wind Speed distribution , Meteorological Data , GIS , CENER maps .

Flashback and combustion stability in swirl burners: review paper

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Abstract

Flame flashback phenomena and combustion stability in a swirl burners represent the major of instability problems that lead to causing a considerable damage to combustion systems as well as the pollution troubles. Recently, researchers suggested many techniques in order to enhancing flame flashback resistance especially against a combustion induced vortex breakdown mechanism in addition to boundary layer flashback. Therefore, the present paper represent a general review about flashback and combustion stability in swirl burners to be as a scientific reference for researchers in this field.

Key words: Flashback, swirl burner, CIVB, BLF, flame stability, swirl flow

Review on the types of solar stills

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Abstract
The Using of desalination technology to meet The demand for fresh water production and that is increasing day by day is due to the increase in world population and with industrial growth . Among technologies used for desalination, Solar stills are easy to design, easy to maintain and low cost compared to other water systems . the same time, it has low productivity , But its disadvantages are low productivity, The aim of this paper is to provide a detailed overview of the various types of solar stills, passive and active design features, single and multi-function designs. And different efficiency improvements, The reflectors used, fins, heat storage, condensers, collectors, Also to improve heat and mass transfers. New advances in phase-change materials and nano composites Are highly promising for further performance development, Subsequent studies in these and other areas needs to be carried out to improve productivity of the solar distillers and take advantage of solar energy in this and other fields .

The Performance of IoT Malware Detection Technique Using Feature Selection and Feature Reduction in Fog Layer

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Abstract:

The rapid increase in the number of devices connected to internet (IoT) lead to expansion in the attacks that targeting these devices. One of these dangers attacks is malware which embedded with IoT devices that makes the detection for such malware is extremely challenging. The machine learning is one of the most effective techniques that used to detect different types of attacks in IoT environment. This technique includes three main stages: feature extraction, feature selection, and classification. The feature selection is the most important stage in ML technique because it contributes to minimizing the size of features which significantly accelerate the detection system. In this stage, most researchers trend to use one of three methods; feature selection, feature reduction and hybrid between feature selection and reduction. The present research aims to present a comparative study between the effect of using feature selection method and feature reduction method on the performance of the IoT malware detection system. The results showed that the proposed technique could achieved an accuracy about 97% when using feature selection method only. These results emphasize that feature selection method is more efficient than the feature reduction method in detection IoT malware.

Keywords:

IoT security, IoT malware, Machine Learning, PCA.

Study the Response Of The Wind Turbine System under Realistic Working Conditions Using Simulink

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Abstract: In recent years, there has been a very rapid development in the field of clean energy due to the huge increase in the demand, which prompted the manufacturers and the designers to increase the efficiency and operating life of the energy systems and especially for wind turbine. It can be considered that the control unit is the main key of the wind turbines. Consequently, it's essential to understanding the working principle of this unit and spotlight on the factors which influence significantly on the performance of wind turbine system. Simulink technique is proposed to find the response of the wind turbine system under different working conditions. In this paper, it was investigated the influence of the rotational speed, type of generator on the response of the wind turbine system.

Keywords: Control system, Wind turbine, Simulink

A new local adsorbent for the removal of toxic metals from industrial wastewater

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Abstract

The ability of light expanded clay aggregate from Shat al-Khora in the city of Basrah to remove heavy metal ions Cr(VI) , Zn(II) , Cu(II) and Fe(III) from industrial wastewater in the State Company of Petrochemical industries was studied in a batch mode adsorption process. The effects of process variables including: pH, adsorbent dose, contact time, adsorbent particle size and temperature were investigated. The results showed that the maximum removal percentage of Cr(VI) , Zn(II) , Cu(II) and Fe(III) ions was achieved at a pH values of 2 and 5 for Cr(VI) and Zn(II)) respectively and at 4.5 for both Cu(II) and Fe(III). The experimental data were fitted using Langmuir and Freundlich adsorption isotherm models. The results indicated that the adsorption of Cr(VI) , Zn(II) and Cu(II) matched with Langgmuir model while for Fe(III) it fitted Freundlich model. Five kinetic reaction models were tested for fitting the experimental data, the results analysis showed successful fitting with the 1st and the 2nd pseudo models for all the heavy metal ions investigated.

Keywords*: Heavy metals ions, light expanded clay aggregate, adsorption isotherms, adsorption kinetics.*

Continuous flow adsorption for phenol removal using environmentally friendly naturally derived bed

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Abstract

Phenol is one of the common contaminants observed in many wastewater industries. It is toxic, hazardous, carcinogenic and listed as a priority pollutant by the Environmental Protection Agency (EPA). This research aimed to establish the efficacy of activated carbon derived from walnut shell in extracting phenol from aqueous solutions using a fixed-green bed column adsorption system. The effect of parameters affecting the adsorption process including the initial concentration of phenol, bed ratio, and flow rate, was studied. The results showed that the highest percentage of phenol removal by the activated carbon is 86.2% at pH 7, initial concentration of phenol 0.001M, bed ratio 1:3 sand/activated carbon, and flow rate 10 ml/min. The breakthrough behavior of the fixed-bed adsorption process was studied. It was observed that the adsorption process equilibrium is practically reached after 105 minutes. The adsorption column dynamic behavior was investigated using three numerical models. The results confirmed that Thomas and Yoon-Nelson models are found more fitted to the adsorption experimental results. Moreover, modeling and interpretation of the column adsorption isotherms predicted that the Freundlich isotherm model is better than Langmuir isotherm model to describe the column adsorption data indicating that the phenol adsorbed molecules are not restricted to monolayer formation and the mechanism of adsorption is chemo-sorption. Briefly, the results of this study pointed out that the activated carbon derived from the walnut shell is not only a low-cost green adsorbent but also has high performance in the removal of phenol from aqueous solutions.

Keywords: Walnut Shell; Activated Carbon; Phenol Removal; Fixed-green bed column Adsorption

1

A review on development of solar thermal flat plate collector

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Abstract

Solar thermal collectors are most frequent type of solar energy applications. Solar collector is a type of heat exchanger where heat exchanges take place between a distance source and a moving heat transfer fluid in the collector. Solar collectors can be categorized as concentrated and non-concentrating according to their design. In this present work, the most important studies that dealt with the development in the manufacture of collectors were reviewed. Studies differed according to the type of improvement discussed, such as use of obstacles, type of fin, absorber plate design, nanofluid as heat transfer fluid and use of enhancement devices. Researchers can take advantage of simulation programs to get the best experiences at the lowest cost and time.

Introducing newly developed Nomadic People Optimizer (NPO) algorithm to find optimal sizing of a hybrid renewable energy

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Abstract

In this work, the main objective the provision of electric supply to a residential complex located in a remote area in Iraq (Thi -Qar) that has no access to electricity grid. This study relied on the Nomadic People Optimizer (NPO) for the Multi-objective design of a grid independent PV/Wind/Battery hybrid energy system. The hybrid systems considered in this study consist of a photovoltaic array, wind turbine, and battery storage. The hybrid system optimized the electricity supply of a residential complex with 30 houses in Thi- Qar which is located in southern Iraq on latitude 31.06^0 and longitude 46.26^0. The major purpose of this optimization is to find optimal sizing of renewable energy with battery storage to minimizing Total Life Cycle Cost ($TLCC$) ,this is an economic aspect , which in turn reduces the cost of energy (COE) ,Second objective is minimizing Total Dump Energy (TDE) with continuous provide the load by electricity (Reliability as constrained) through life cycle of project for a 25 years . The data used in this study, such as solar radiation, wind speed, and temperature was collected from weather forecast in Thi- Qar for every hour over the course of a full year; the electrical demand was collected from Thi- Qar Electricity Distribution Directorate for the same housing complex and the same number of houses in an area equipped with electricity. Also, the prices of the system components, cost of maintenance, and cost of fuel were collected from Thi- Qar Iraq market.

Keywords: Renewable Energy, Solar Energy, Wind Energy, Nomadic People Optimizer, Optimization.

1

CFD analysis of the thermal performance improvement in heat sinks with corrugated plate-fin

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Abstract

A 3-dimensional numerical analysis is performed to study the thermal performance in three new designs of the corrugated plate-fin subjected to impinging airflow for Reynolds number range from 1600 to 7700. The three designs of pate-fin heat sink include a triangular (TRI-PFHS), a rectangular (REC-PFHS), and a semi-circular (SCR-PFHS). A comparative evaluation has been performed on the thermal performance of the suggested designs with the traditional type (T-PFHS). The results revealed that the thermal performance of new designs is higher than that of the traditional heat sink. The new designs of corrugated plate-fin heat sink have proved the ability to improve heat transfer due to the larger area offered by corrugation and high flow disruptions caused by the presence of a semi-confined channel. The performance of the new designs is assessed in terms of Nusselt number, pressure drop, and performance factor. The overall performance factor (Pf) for SCR-PFHS is predominant over all other designs which achieved a highest value of 1.76 at Re=7700.

Physical and Mechanical Properties of Reed Fiber Cement Board

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Abstract:

In this work fibers of dry reed was used a reinforcing material to produce cement boards after being chemically treated in order to enhance the bonding between mortar and fiber and prevent the dissociation of the composite material with time. (2%,4%,6%,8%) percentages of reed fiber was mixed for every Reed fiber size (300μ,150μ,75μ)

The curing period was 14 days, physical and mechanical tests were performed according to ASTM standard c-1185.
Different variation in results observed by changing fiber content and fiber size. The results showed an enhancement in density ,thermal insulation, by increasing reed fiber content and decreasing in size, while its shows an increasing in moisture content and water absorption by increasing reed content because reed is one type of soft wood ,the wood property is absorbing and keeping moisture. The best dry and wet flexural strength is in 8 wt% of 150μ reed fiber.
Keywords: cement board ,reed fiber, red iron wood (Lophira alata)
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Investigate and Compare Software-Defined Network Controllers for UAV Networks Management

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Abstract. Unmanned aerial vehicles that abbreviates (UAVs) are flying platforms, known as drones, which have features such as mobility, adaptive altitude and flexibility. UAVs admit numerous applications that can be used as aerial base stations to enhance coverage, capacity, and energy efficiency of wireless networks. On the other hand, UAVs can operate as flying mobile terminals within a cellular network. Such cellular-connected UAVs can enable several applications ranging from real-time video streaming to item delivery. A Software Defined Network (SDN) Controller is the application that acts as a strategic control point in a software-defined network. It is the "brain" of the network. Controller manages flow control to the routers/switches 'under' (via southbound APIs), the business logic and applications 'above' (via northbound APIs) to deploy intelligent networks. Wireless networking with software defined (SDWN) is the use of SDN conceptions in wireless networks by using a controller in the control plane. SDWN facilitates the creation of new adaptive mechanisms according to various applications and user requirements, such as mobility, handover, security and quality of service (QoS). In this paper, simulation work has been conducted to compare and investigate four SDN controllers (Pox, Ryu, Floodlight and OpenDaylight) in order to see which one is suitable to be used. Mininet-Wifi has been selected as the simulation tool to do the experiments and Python script for programming. The results obtained reveals that Ryu controller is the best selection in terms of latency and packet loss.

Keywords: Mininet-Wifi emulator, SDN UAV Networks, SDN Controllers, SDWMN

Evaluation of the Groundwater Quality for Irrigation: Case Study of Hilla district, Babylon Province, Iraq

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Abstract. A crisis of water scarcity in the world encouraged researchers, especially in the arid areas to know the nature and quality of all its sources regardless of surface water. The groundwater evaluation for irrigation was suggested by using the model of Water Quality Index for Irrigation (WQIIR) in the ArcMap/GIS Software. This model was applied to 48 wells distributed throughout the Hilla district, Babylon, Iraq. The samples of EC, Ca^{+2}, Mg^{+2}, Cl^{-1}, Na^{+1}, $HCO3^{-1}$, and SAR for groundwater were collected from these wells during wet and dry seasons in 2016. The generated maps in GIS for the WQIIR model in both seasons were divided into categories based on restriction`s groundwater use for irrigation. These categories consisted of Severe Restriction (SR), High Restriction (HR), Moderate Restriction (MR), Low Restriction, and No Restriction. The areas values and their classification of restriction`s groundwater use for irrigation related to the five categories that resulted within the generated maps in GIS using the WQIIR model in the wet season (in km^2) were: 42.79 (SR), 407.05 (HR), 377.77 (MR), 32.39 (LR) and 0.23 (NR) respectively and for the dry season were as follows: 42.79 (SR), 407.05 (HR), 377.77 (MR), 32.39 (LR) and 0.23 (NR) respectively. The areas and the classification categories of restriction groundwater for irrigation calculated based on the values resulted from the WQIIR model have shown variation in the dry and wet seasons.

Using Box-Behnken experimental design for optimization of gas oil desulfurization by electrochemical oxidation technique

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Abstract

Iraqi gas oil with sulfur content 9400 ppm was desulfurized electrochemically at constant current (300 mA), the process consists two steps; first step is electrochemical desulfurization by using electrochemical cell contains two graphite electrodes while the used electrolyte is NaCl to enhance electrolyte electrical conductivity, and hydrogen peroxide as an oxidant agent, second step is extraction with acetonitrile. Optimization of process parameters was done by applying response surface methodology RSM combined with Box –Behnken experimental method, in which the sulfur removal efficiency was acted as response function while the reaction temperature, NaCl concentration and time were selected as controllable (studied) variables. The sulfur removal efficiency was ranged from 55.84 % to 88.07%. The results were analyzed with Design-Expert software by fitting with second order polynomial model and the empirical model was exhibited high correlation factor (R^2=0.9966) and the estimated optimization solution stated that maximum sulfur removal efficiency is 88.611% at temperature (57.656 ℃), NaCl concentration (0.106 M) and, time (51.46min.).

Keywords:

Oxidative desulfurization, Design experiment, Box- Behnken, ANOVA.

Effect of Higher Alcohol (Pentanol-Heptanol)–Biodiesel–Diesel Fuel Blends on the Performance and Emission Characteristics of a Direct-Injection Diesel Engine's

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Abstract:

Alternatives of fossil fuel resources as renewable biodiesel fuel and alcohols represents latest technology to be developed associated with the declining of fossil fuel resources along with higher crude oil price. In this study, four-stroke, single cylinder, and direct injection diesel engine performance and emissions are evaluated. The engine was running at variable speeds (1600-3000 rpm). 15% and 25% of pentanol and heptanol were added to the diesel-biodiesel mixture. The experimental results showed increasing in brake specific fuel consumption with the increasing of higher mass fractions of alcohol blends, which is attributed to the decreasing the lower heating value (LHV) of the blends. Higher brake thermal efficiency compared to diesel fuel was produced. An expressive reduction in carbon monoxide (CO) of (16.1% - 46.6% vol.) with total unburned hydrocarbons (UHC) decrease of (7.4% - 25.3% ppm), and nitric oxides (NOx) of (8.5% - 23.5% ppm). Biodiesel and alcoholic blends are suitable to be used as alternatives to diesel without the need for any modifications in conventional diesel engines.

Keywords: Biodiesel, Higher alcohol, Pollution, Sunflowers oil, Trans-esterification.

Performance enhancement of damaged two way concrete slabs

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Abstract
This paper studying the flexural behavior of reinforced concrete with two-way slabs repairing by (CFRP). Normal concrete was used to cast the reinforced concrete two-way slabs. The experimental works includes testing four reinforced concrete with two-way slabs having dimensions (1050 mm x1050 mm x 60 mm) and with reinforcement (Ø8 @100 mm). All slabs had been subjected to concentrated load and tested as simply supported for all four sides of slabs. So this work including one slab which is not repairing as (control) and three slabs with repairing, the three slabs can be divided into two groups tested as different percentage (50 % and 75 %) of load, and as different configuring shapes of repairing (two shapes).
Keywords: CFRP , FRP, Repairing slab.

Investigation and study of hydraulic fracturing and the efficiency of this in oil reservoirs naturally fractured and caven

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Abstract. Hydraulic fracture operation is one of the key technologies for the development of caven reservoirs. Modeling of hydraulic fracture processes to factors such as Situation of tensions, Shear strength and Orientation of natural fractures in the reaction(In particular, the potential for opening cracks in areas that are growing along the path of a hydraulic fracture) And also the length and height of the hydraulic fracture. Due to the presence of natural fractures with diffuse penetration and different orientations, the operation is complicated in caven reservoirs. For this purpose, two numerical methods are proposed for simulating the hydraulic fracture in caven reservoirs.In this paper, the hydraulic fracture model is considered in terms of the state of tensions, On the reaction between the hydraulic fracture and the natural fracture (45 °) And also the effect of length and height of hydraulic fracture, , Developed and how to distribute induced stress around the well, , In order to determine the direction in which the hydraulic fracture is formed in that direction The finite difference method and the individual element for numerical solution are used and simulated.An inverse suction is an important parameter And in the operation of the hydraulic fracture will reduce production,This simulation is being studied. In every length of the hydraulic fracture , The rate of production is measured and the causes of

changes in the input rate to the wells are discussed based on the natural fractures cut by the hydraulic fracture and the induction of the fracture. Finally, it can be seen that the optimum hydraulic fracture time will be The hydraulic fracture is able to connect natural fractures with large and large streams And finally, it is connected to the well, and there is a fundamental difference between the tensile and shear opening. The analyzes indicate that the growing hydraulic fracture, the tensile and shear stresses applied to the natural fracture.

Key words:hydraulic, fracturing, efficiency,reservoirs,caven.

Experimental study for steel arch beams of compact section with circular web openings

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Abstract: An experimental study for the behavior of steel arch beams with and without web circular openings, non-strengthened and strengthened using steel stiffeners had been investigated. Seven models of simply supported I shape steel compact section arch beams have been tested in laboratory. One of the models was without opening as control beam and the other six models were with openings and divided into two groups: Group (1) consist of three arch beams with different numbers of non-strengthened circular openings in various locations, Group (2) consist of three arch beams with circular opening and strengthened with steel stiffeners. There are four parameters considered in the test: existence of circular opening, location of opening, number of openings and strengthening effect using steel stiffeners. The test results showed that the presence of openings in the web at midspan of steel beams decrease the ultimate load capacity by about (12%) while edges openings had no significant effect on ultimate strength with same opening diameter.

Key Words: Steel Beam, Arch, Web circular Openings, stiffeners

Design and Optimization of Coupled and Self-Adaptive of An Underactuated Robotic Hand Using Particle Swarm Optimization

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Abstract

A large work has been devoted to create and design the novel underactuated robotic hand that mimic human hand in terms of motion and grasps. The objective of this paper is to design and development of four-finger underactuated robotic hand mechanisms with 2-DOF for each finger that is highly underactuated which controlled by single actuator that can be used with wide applications. The principle of this hand mechanism is to use the linkage seesaw differentials and the design of robotic finger integrates segments by pin joints and a tendon, that allowing it easily of grasping and adaptable different objects. Furthermore, the robotic finger was designed with combines advantages of the concept of rigid coupled and self-adaptive into one unit to achieve better performance with simple design . To plan the trajectory of the robotic finger and force-isotropic that resembled the human finger in motion and grasping operation , Underactuated finger mechanism was preliminary analysis to predict the relationship between the joint angles of robotic finger related to mechanical parameters as well as contact forces then, modified by optimized set of parameters using particle swarm optimization (PSO). Where, the parameter design constraints were formulated for a multi objective optimization problem using the evaluation criteria for human finger in motion and grasping. Experiments were conducted in order to validate the theoretical analysis by addition of angles sensors on

each segment of fingers and the results show that the proposed hand is able to mimic human hand in terms of motion and adaptive grasps.

Keywords: Robotic hand, underactuated finger, seesaw differentials, coupling mechanism , self-adaptive , particle swarm optimization (PSO).

Table1 Symbol Definition

Symbol	Description	Units
d_i	The distance between tendon force and joint.	mm
F_{si}	The force of stretching spring of the ith spring.	N
F_i	The reaction force produced by the ith segment on the object.	N
K_i	The stiffness coefficient of the ith spring.	N/mm
L_i	The length of segment.	mm
L_0	The length of closer tendon turning.	mm
M_i	Pre-loading torques of the springs in the initial stage.	N.mm
R_i	The force applied which produced by the tendon.	N
S_{1i}	The length of spring in initial state of the ith spring.	mm
S_{2i}	The length of spring after motion of the ith spring.	mm
T	The tendon force created by the actuator .	N
x_i	The perpendicular distance from force spring to the joint.	mm
β_i	The angle of ith tendon turning.	Rad
θ_i	The angle of rotation of the ith joint.	Rad
κ_i	The lever arm of F_i.	mm
τi	The moment of the ith joint .	N.mm

Sustainable tourism planning (case study of Al-Manar City - Republic of Iraq) study of potentials and means of development

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Abstract. This paper examines the possibility of investing in tourism components in the marshes, which, if optimally exploited, makes Iraq an advanced tourist country, especially after the return of water to it and its revival again, by choosing a model in the marshes of the city of Al-Manar to plan a typical tourist village in it and can be generalized In other marsh areas where different tourism components will be exploited and used because this village is similar to the residential villages in the region in terms of the structural form and the method of using transportation to reflect the image of the traditional village of the river, however, it is in line with the requirements of tourist resorts in terms of

providing various tourism services that The tourist feels comfortable, and through this tourist village there will be a tourist movement in the region for Arabs and foreigners, which helps in the exchange of information, learn about the heritage of the region, learn about its civilizations and practice various activities, as well as its economic returns through tourism and commercial activity in the tourist village and the region in general, Villages will provide many job opportunities for residents of the region, which reduces the unemployment rate and contributes to social change Cultural in the marsh community.

Structural Response of Post-Fire Exposed Reinforced Concrete Column with Pre-Load

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Abstract. This paper presents the results of experimental and numerical studies of the fundamental response of normal concrete (NSC) columns under fire exposure with pre concentric load. The present study aims to investigate experimentally the behavior of reinforced concrete columns exposed to fire flame with concentric axial load, post-fire behavior under the effect of axial eccentric load. Also, it aims to give a comprehensive account of the fire effects on the ductility and stiffness of these columns. The test results indicated that columns lost about (47.60-51.4) % of bearing capacity after exposure to fire at 500 °C with one hour. Moreover, increased decrease in residual bearing capacity significantly with increasing load level applied during fire

exposure. Also, Non-linear finite element (FE) analyses of post-fire exposed RC columns with axially load using the ABAQUS computer program is discussed in this paper.

Keywords: FEM, Fire, compressive strength, reinforced concrete columns.

EFFECT OF THE ELECTRODEPOSITION CONDITIONS ON THE EROSION CORROSION OF AUSTENITIC STAINLESS STEEL 316L USING RESPONSE SURFACE METHODOLOGY (RSM)

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ABSTRACT

This study represents an attempt to improve the erosion corrosion resistance for industrial pumping station used to produce sulfuric acid through electrodeposition coating samples of Austenitic stainless steel 316L. Minitab 19 program was used to precipitate a composite coating layer (Cr-WC) because it is used in many industrial applications that require corrosion resistance, As well as high hardness. The samples were coated using different variables as inputs:

temperature(T) ,WC concentration(WC wt%), stirring velocity (r.p.m) and deposition time (t) for four levels using central composite design for design laboratory experiments. The factors of coating thickness (C.T), surface roughness (Ra) and micro- hardness (HV) were adopted as outputs response and a complete analysis of variances (ANOVA) at constants significances levels of %5, was done to fully identify the most significant parameters.

The surface response methodology (RSM) was used to provide an optimized model with the best optimum properties such as micro-hardness, surface roughness, coating corrosion rate and oxidation corrosion rate to improve the corrosion resistance of Austenitic 316L stainless steel samples..

The results showed respectively that the wc wt.% was the most effective on all the outputs response then deposition time (min), temperature(T) and stirring velocity (r.p.m).

Key words: Austenitic stainless steel 316L, Electroplating, Cr-WC Composite Coating Layer, Hardness,Erosion corrosion resistance ,Response Surface Methodology (RSM), Central Composite Design (CCD).

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Design a Suitable Optimized Low Pass FIR Filter for Ultrasonic Signal

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Abstract

Sensors play a vital role in the human life, so it is very important to improve their output signals. One of the most known sensors is ultrasonic sensor. The mentioned sensor uses simple principle to measure a distance between it and nearest obstacle. The output of this sensor improved in this work using FIR filter. The FIR filter parameters are calculated based on Genetic Algorithm (GA). The simulated results using MATLAB show that the optimized filtered data is more suitable and effective to use in many applications.

Keywords: FIR Filter, GA Optimization, Ultrasonic Signal, Arduino.

STRENGTHENING OF SELF-COMPACTED CONCRETE TWO WAY SLABS WITH OPENING USING NEAR SURFACE MOUNTED (NSM) FIBER REINFORCED POLYMERS (FRP) TECHNIQUE

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Abstract:
The effectiveness of near-surface-mounted carbon-fiber-reinforced polymers on strengthening of self-compacted concrete two-way slabs with opening was investigated experimentally. The experimental work included testing eighteen specimen two-way slabs with an opening, which included 6 control specimens and 12 strengthened with CFRP strips and tested under four-line load around the opening. The dimensions of the slab specimens are (1000 × 1000) mm, (100) mm depth. The reinforced concrete slabs containing a single concentric opening with 3 different skew angles (0°, 30° and 45°) strengthened by CFRP strips. Strengthening effectiveness was investigated on slabs using near-surface-mounted carbon-fiber-reinforced polymer strips with inclined and combined configurations. The results showed , firstly, that the load-carrying capacities of the self-compacted concrete slabs with openings have been decreasing with skew angle increasing and secondly that using near-surface-mounted carbon-fiber-reinforced polymers increases the ultimate strength of two way slab self-compacted concrete slabs by (1%−32%) for both strengthening configurations, with the combined configurations performing better. Also, the cracking load and stiffness increased, while deflection and toughness decreased.

Keywords : near-surface-mounted carbon-fiber-reinforced polymers, self-compacted concrete, strengthening, two-way slabs with an opening.

Study of the Bending Characteristics in Composite Sandwich Structures – A Review

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Abstract: In several applications reaching from satellite, ships, aircraft, vehicles, railcars, bond construction and much extra, using sandwich constructions have increased rapidly in different fields. The aim of the subsequent paper is to include an overall summary to sandwich construction and explanation of mechanics structural including forms of actuating loads, failure modes found in sandwich panels and standard three-point bending study of sandwich construction.

Keywords: *sandwich construction, failure modes, honeycomb core, bending study, defects.*

Study of Shallow Groundwater in Al-Diwaniya City / South Iraq

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Abstract. Al-Diwaniya city suffers from shallow groundwater levels, which cause serious problems on the foundation of builds in the area and affect the general health of citizens in residential areas. For investigating

this problem, four different paths perpendicular to Shatt Al-Diwaniya were selected, along 11 hand-dug wells in the city to observe groundwater levels during a whole year (2019-2020). The work included observation boreholes water levels and comparing results with water levels in the Shatt al-Diwaniya. Along each of the four selected paths (A, B, C, and D), two boreholes are observed on each side of the Shatt al-Diwaniya. Depths of boreholes are from 6 to 12 m. All boreholes paths that represent shallow groundwater within residential districts. The water level of Shatt Al-Diwaniya and groundwater levels is monitored twice-per-month, especially over high and low water conditions within Shatt Al-Diwaniya. Hydrometric results showed a relationship between shallow groundwater and Shatt Al-Diwaniya levels in track A. The nature of this interaction along with the track A due to many local factors such as depth of water in Shatt Al-Diwaniya , amount of rainfall, factors of high water levels, conditions and climatic changes, soil factors and the current state of the deterioration of the sewage network in Diwaniya city. Finally, the results of the rest tracks indicated that the city is flooded with shallow groundwater due to the large sewage leakage in addition to the rainwater and that Shatt Al-Diwaniya does not affect groundwater in the area. Still, it works discharge groundwater in the city.

Keywords: AL- Diwaniya City, Shallow Groundwater, Shatt Al-Diwaniya.

Magnetic–type Climbing Wheeled Mobile Robot for Engineering Education

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Abstract
The tendency of developing wheeled mobile robots in different applications is growing every day. During the past decades, the need for robots capable for climbing vertical wall has been increased. As a result of that, this paper presents a light and low cost wall climbing robot WCR of wheeled locomotion and adopted neodymium magnets to provide adhesion force. This climbing system is intended to be used for educational and research purposes. The mechanical and electrical constructions are presented. The proposed design has the ability to achieve ground-wall transitioning. In order to provide sufficient information about robot mass properties, novel mechanisms to determine the coordinates of the center of mass COM and moment of inertia MOI of the proposed climbing robot have been introduced. In addition, the vision system was suggested to provide feedback signal of robot pose (position and orienting). Finally, to evaluate the performance of the robot design, a prototype was built and tested in the laboratory environment.

Keywords:

Wall climbing robot, educational purpose, magnetic Adhesion mechanism, center of mass, moment of inertia

Study the effect of different types impellers on the transfer coefficient in photobioreactor.

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Abstract
In this research ,study the effect of different types of impellers on the overall volumetric mass transfer coefficient, (determination of K_LaO_2 is very important for photobioreactor design and process analysis , Where through measuring K_LaO_2, the volumetric mass transfer coefficient of carbon dioxide is calculated based on the following relationship $klaCO_2 = 0.9\ klaO_2$ Which is one of the most key factors that depend on it in the design of the photobioreactor)then make comparison between them ,the impellers type which used in this research is 4-blade propeller, mixed flow impeller, 2-blade propeller(plastic) , a hybrid photobioreactor type has been used in this research, which is a mixture of a bubble column and the stirred tank photobioreactor ,The variables that studied in this research are the impeller speed (100-500) rpm, the rate of airflow into the reactor (1-4) L/min, and the type of impeller used. K_LaO_2 can be measured by static gassing out method. Through practical experiments, it was found that the highest value of K_LaO_2 in the 4 blade propeller was at a flow rate of 2 liters per minute and impeller speed 500 rpm, which equals 0.0091 (1 / s). As for the impeller (mixed flow impeller), the highest value of K_LaO_2 was at a speed of 500 rpm and a flow rate of 4 L / min which equals 0.0118 (1 / s). The highest value of K_LaO_2 in the impeller 2 blade propeller (plastic)) was at a flow rate of 4 liters per minute and impeller speed 500 rpm which was equal to 0.0101 (1 / s).A comparison is made between the three impellers on the basis of their efficiency in giving high values of K_LaO_2, where it was found that the mean value of the K_LaO_2 for the impeller (mixed flow impeller) is higher than the other impellers, where the average value of the K_LaO_2 at a speed of (100-500) rpm and the flow rate(1-4)L/min is 0.00806 (1 / s). This means that the type of impeller (mixed flow impeller) has a high efficiency of mixing and mass transfer between gas and liquid. In this study, correlation equations were developed for each impeller to see the correctness of the results according to specific exponents and constants within the range of previous studies and research, and it was found that theoretical volumetric mass transfer coefficient values are close to practical volumetric mass transfer coefficient values.

Keywords: volumetric mass transfer coefficient of oxygen; process variable; correlation studies; hybride photobioreeactor;microalge
Gas-liquid mass transfer, volumetric mass transfer coefficient of carbon dioxide

Numerical Investigation for the Structural Behaviour of Different Strengthening Techniques for Partially-Loaded Square Self-Compacted Concrete Short Columns

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This paper aims to study numerically the structural behaviour of partially loaded square SCC short columns strengthening with various techniques such as near-surface mounted with steel reinforcement bars (NSM), CFRP wrapping, and both of them (hybrid technique). For this purpose, the results of the ultimate strengths and complete load-deflection response of strengthened columns investigated experimentally in an under-publishing paper were used to verify the accuracy of the computational results. Additional parameters were examined throughly the numerical work, such as the effect of extra CFRP layers, the effect of various compressive strengths, the effect of changing initial loading ratios, and the effect of various numbers of CFRP strips. Results showed that the numerical investigation recorded an excellent agreement with the experimental work through the convergence in the value of both the ultimate load and maximum displacement. Furthermore, increasing the layers of CFRP laminate was active in the specimens strengthened with full CFRP wrapping and hybrid one. The same effect occurred as the compressive strength of the column increased. Rising the loading ratio caused a decrease in the strength capacity for the columns. In contrast, decreasing the spacing between two successive laminates increased the ultimate load capacity for the specimens enhanced partially wrapping with CFRP laminate.

A Dimensional Analysis of Local Sandy Soil Erosion Induced By Leaky Sewer Pipes

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Abstract

Soil erosion is the most important reason that leads directly to the formation of sinkholes in the roads of urban areas. Soil erosion occurs due to the movement of water from and into the surrounding soil through defects in sewer pipes. In the present study, dimensional analysis of the erosion process was carried out and a dimensionless model was proposed to estimate the rate of erosion for local sandy soil. Model tests were conducted under a varying matrix of influencing parameters including: leak size, soil particle size, initial water content, water flow rate, height of water level above the defect in soil, and number of water flow cycle. The experimental model involved soil exposed to cyclic water flow through leaks located at the bottom of the model. Eroded soil is collected, dried, weighted and sieved for each cycle. From the results, it was found that the proposed dimensional analysis prediction model can reasonably estimate the rate of erosion for the local sandy soil.

Key words: sewer pipes, leakage, model test, soil erosion, dimensionless

Optimum Groundwater use Management Models by Genetic Algorithms in Karbala Desert, Iraq

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Abstract

Shortage in resources of water in semi-arid region as in Iraq have become an increasing extent dangerous problem. This research objective to improve a new management simulation model for resources of groundwater by linked simulation-optimization (S/O) model. The numerical responses of the 3-D numerical model were Integrated with Genetic Algorithm (GA) optimization model in order to obtain the optimal use of groundwater resources in study area of Karbala desert area in Iraq. The three-dimensional numerical simulation program is used to simulate the system of groundwater flow for Al-Dammam confined aquifer under different conditions. The development management simulation model was adopted by operating the model with considered calibrated variables for current and future periods. Results of analysis the management (S/O) models indicate that the maximum value of pumping rate is reach to (450 E05) m^3/year). Also, the pumping rates of the wells within study area could be increased to three times the present water required, with a maximum fall reach to 7.21m in the static heads of groundwater of aquifer.

Keywords: MODFLOW; Genetic Algorithm; Simulation-optimization; GMS.

Optimization of glass powder content in self-compacting concrete as partial replacement of cement

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   Abstract-The main aim of the present work is to investigate the fresh and hardened properties of self-compacting concrete by utilization recycled glass powder as partial replacement material for cement and to specify the optimum percent from performance and sustainability point of views. In this study, five mixes were designed with different percentage of grinded glass powder used as cement replacement at 0%, 10%, 20%, 30%, and 40% by weight. Slump flow diameter, time needed to achieve a flow diameter of 500 mm, sieve segregation resistance and L-box height ratio were utilized to examine the rheological properties of the produced self-compacting concrete. For the main mechanical properties, compressive strength at 7, 28, 56 days, splitting tensile, and flexural strengths test at 28 day were conducted. The test results illustrate that the increase in the partial replacement of cement by glass powder led to keep flow ability and caused small decrease in T$_{500 \text{ mm}}$ time. However, there was slight decrease in the passing ability and better performance in segregation resistance compared to the mix without glass powder. The mechanical properties of the produced mixes increased up to the replacement level of 30%. However, the optimization results using Minitab 18 statistical software deduced that the optimum percent is 24% to achieve optimum performance in terms tested properties and evaluated sustainability aspects.

   Keywords— self-compacting   concrete,   Glass powder, fresh properties, mechanical properties.

MANAGING 5G LTE ADVANCED NETWORKS THROUGH MACHINE LEARNING INTELLIGENCE BASED SYSTEM

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Abstract

The development of 5G mobile communication systems is aiming at meeting the boosting needs of mobile Internet traffic in the next 10 years. Some key technologies have been put forward in the next generation mobile communication technology (5G) such as millimeter waves and Small Cell to meet the requirements. The development of small cell networks offers higher chances in increasing capacity while reducing power consumption, since the small cells are effective supplements to macro cells with less power consumption in each single small cell. The problem is that deploying dense small cells may not actually save the total power of the system. To solve this problem, the small cells could be switched off during the time when traffic load is not that high, and switched on when large number of users appear in the hot spot area. However, switching off the small cells may lead to lower chance of offloading and harm the throughput. The performances of the algorithm are also evaluated by building a simplified LTE model with one macro cell and several small cells in MATLAB. Besides, the main traffic data of the network comes from the simulation in MATLAB which is considered as more realistic. To show the details of power consumption changing, we take the simulation time as a whole day (24 hours) while achieving and accuracy of 97.82%. By using the K-Means clustering machine learning based algorithm, the system power consumption can be largely reduced during peak hours and the decrement of throughput is within an acceptable range with management. The deployment of around 110 small cells in a macro cell shows the best performance.

Keywords: Small Cell; K-Means; Power-Consumption; Management; Base-Station; 5G; Machine Learning

The role of open museums outdoors in the revival of intangible cultural heritage

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Abstract
Urban environments suffer from weak investment of intangible cultural values in stimulating urban environments and public places that are popular with people, thus exposing them to forgetting and weakening the urban memory of the local community. Most countries that have historical roots of those values that can be invested in urban tourism support and maintain.

The idea of reviving the values of non-material through the creation of museums Anthropological (Open) Museums, That gives way to display that heritage to ensure community participation, cultural diversity and support for urban development. The levels of cultural expression have multiplied in museums, but they have emerged clearly in aspects including economic, cultural, urban memory, cultural planning, in addition to the aesthetic and symbolic aspects).

The research dealt with those levels that were extracted from previous literature and international examples related to the revival of intangible cultural values in open museums. The research found that museums have achieved an important role in the process of cultural revival of intangible values and make them visible to society at several levels, relying on the revival of stories, myths, customs, and social traditions that took place through the participation of the local community in working in these museums most of the time and turning those museums into points of attraction A mission that contributed to increasing social and cultural interaction, reviving economic and civilizational aspects, and providing job opportunities for the local community. I also contributed to increasing awareness and interest in these non-material values.

Key words: open-air museums, cultural heritage, intangible cultural heritage.

Numerical study of nanofluid natural convection in a partially heated tall enclosure

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Abstract. Numerical study of natural convective heat transfer of partially heated tall rectangular cavity filled with (Al_2O_3-water) nanofluid. Two opposing horizontal walls are adiabatic, while the right vertical wall is kept at fixed cold temperature, and the left wall of the cavity heated partially. The effect of Rayleigh number (Ra), Aspect ratio (A), and the volume fractions of nanoparticles (ϕ) on the isotherms, streamline, and the average Nusselt number (Nu) have been investigated. The dimensionless governing equations with the Boussinesq approximation have been solved numerically, by using the finite element approach. The results presented for a wide range of parameters including; ($10^3 \leq Ra \leq 10^5$, $5 \leq A \leq 10$, and $0.02 \leq \phi \leq 0.06$). The result shows that; the Nu increase when the effect of Rayleigh number (Ra), and the volume fractions of nanoparticles (ϕ) increasing, and also it increase when the Aspect ratio (A) increasing.

Keywords: Natural Convection, Nanofluid, Al_2O_3-water, tall enclosure

Numerical Study to Enhance The Electrical And Thermal Efficiency Of PV/T System.

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Abstract

At increases the PV module temperature, electrical efficiency of a photovoltaic cells will be decreases. Due to facing the PV module to the solar irradiance to generate electricity, heating the PV cells is inevitable. A thermal channel collector   can be used to absorbed heat from a PV cells, this heat absorbed from the cells can be using for other application, therefore increasing the electrical and conversion efficiency. The thermal collector system consists of a rectangular channel made from insulating materials (form) and on it the round water guides, is mounted to the backside of PV panel, through which water flow. In this modeling and numerical study , to solve this problem, was adding a cooling system to the PV panel. In the result, the benefit from this work to cooling the solar cells and increase the electrical efficiency, also to obtain heat gain in the form of hot water. Shown the simulation results, the   absorber of thermal collector channel generates the maximum electrical efficiency of 14.6674% with maximum thermal efficiency of 82.532% at ambient of temperature set between 27°C to 32°C, set the temperature of inlet water at 27°C, water flow rate range (1-5) Liter/minute by increasing ratio of (1Liter/minute) and solar radiation between 300 to 1000 (W/m^2) by increasing ratio of 100 (W/m^2). Because high effectiveness and perfect the contact surfaces between the PV module and the thermal collector channel underneath, the recommended of (PV/T) system to enhance heat transfer.

Key-Words: - PV/T system, Thermal collector channel, (Thermal, electrical) efficiency, water guides.

Image Processing Encryption

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Abstract

The aim of this research paper is to develop a new approach of image processing encryption using machine learning techniques in python So that the human cannot understand the images because it is in encrypted form and can be securely transfer to its destination. We also used the computer-generated Holography (CGH) technique to encrypt and decrypt images. We first implement an existing algorithm and verify the claims of the authors. We then investigate higher dimensional Baker maps for image encryption. For this, we first propose a new interpretation for the Baker map in terms of a path function S. We then apply the higher dimensional maps for image encryption and experimentally conclude that 3D Baker map suffices for encryption. That is, there is no perceptible performance gained when using higher dimensional Baker maps. Next, in an attempt to use chaotic maps for the diffusion mechanism in the encryption scheme, we embed the diffusion process into the confusion process. For this, we first propose an alternative view of a 2D image as a 3D structure using the binary representation of the image intensity values. We extend this scheme from grayscale images to color images and show its immense value in color image encryption. Lastly, we propose a Baker map based on random walk of the image. Here, we employ sparse decomposition of images as a method of generating the random paths. Random walk-based Baker maps would be more difficult to break than traditional Baker maps because of the chaotic behavior in the walk itself. The significance of images and their sharing is increasing day by day. Their security is becoming an important issue while transferring over a public network. To protect images from hacker's secret sharing is one of the best techniques. The secret sharing is a way to share a secret with n participants and then setup is made for t or more number of participants who must contribute to revealing the secret. Here $t \leq n$ is known as a threshold which must be achieved for secret reconstruction.

Keywords: Machine learning, 3D Baker map, Secret image sharing, Computer Generated Holography (CGH).

Nonlinear Finite Element Analysis of Reinforced Concrete Beams Subjected to Torsion

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ABSTRACT

This work aims to investigate the behavior of rectangular-section of reinforced concrete beams subjected to torsion by using the finite element method. An analytical study is presented in the current work on thirty-four beam specimens divided into two series. Compressive strength of concrete is the main parameter for first series which contains sixteen specimens (high strength concrete HSC and normal strength concrete NSC), the spacing of the stirrups is also investigated in this series. Second series, includes eighteen beams investigated for the effect of some parameter on the torsional capacity. These parameters are amount of longitudinal and transverse reinforcement, yield strength of longitudinal and transverse steel, reinforcement stresses, and crack patterns of HSC and NSC beams.

The results showed that for RC beams, the transverse reinforcement is more effective in resisting the applied torque, it is preferable to use a higher ratio of transverse reinforcement for the NSC and HSC beams, where the increase in ultimate torque was about 94% for an increase in the ratio from 6% to 16% , the effect of yield strength of steel is about 4.1% by changing the yield strength by 13.6% from 440 MPa to 500 MPa. The increasing of transverse reinforcement spacing significantly improves and increases the ultimate twisting angle. The mode of failure for the RC beams is more affected by the reinforcement ratio and the typical mode of failure for rectangular section beams is diagonal tension failure for both concrete grades.

Key words— ANSYS, Finite element analysis, High strength concrete, Nonlinear finite element, Normal strength concrete, Reinforced concrete beam, Torsion.

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An approach for contingency ranking analysis of electrical power system

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ABSTRACT—**This paper presents an algorithm for ranking the critical contingencies in a high voltage power system. The presented approach based on a hybrid weighted performance index. The hybrid performance index measures the overloaded transmission lines and bus voltage deviation out the permissible limits. A linear technique is used in computing the hybrid performance index. The proposed algorithm is applied to the IEEE24 bus reliability test system. There is a good match between the results obtained with the proposed algorithm with those obtained by applying a full AC load flow iterative method.**

KEYWORDS- contingency; hybrid performance index; critical ranking; power system security

Investigation the effect of intensity and direction of light on the removal of reactive blue dye from simulated wastewater using photo-Fenton oxidation under UV irradiation: Batch and continuous methods

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Abstract: This study aims to remove reactive blue dye (R.B) from simulated wastewater by utilizing advanced oxidation processes (AOPs) using a photo-Fenton (UV/H_2O_2/Fe^{+2}) system. A photo-reactor containing four fixed UV lamps had been employed in a batch and continuous mode under the effect of several operating variables (dosage of H_2O_2; dosage $FeSO_4$; pH; temperature; irradiation time). Response surface methodology (Box–Behnken design) and Portable Statgraphics Centurion statistical software were used to design the experiments and conducting the mathematical correlation of the required responses as well as the interaction effects among variables. The optimal conditions of the operating variables; dosage hydrogen peroxide, ferrous sulphate, pH, temperature and irradiation time were 78 ppm, 20 ppm, 3, 40°C and 90 min, respectively which give 84.82% of removal efficiency. Then, the effect of light intensity and distance from a UV source were studied at optimum conditions in the batch photo-reactor where the highest dye removal efficacy was obtained at a light intensity of 24 w and a distance of 15cm. For continuous system, two operating conditions were studied, the direction of the light radiation and the flow rate which proofed that the dye removal efficiency decreased with an increase of flow rate and the top direction compared to the side direction of the light where the removal percentage of (R.B) was 100% for the flow rate of 10 ml/min while it was 84.16% for a flow rate of 50 ml/min**.** The results show that the photo-Fenton method is an effective treatment method of Wastewater containing dyes.

Keywords: Wastewater treatment; Reactive blue dye; Advanced oxidation; Photo-Fenton process; RSM; Optimization.

Improve Efficiency Solar Cells Using PID Controller

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Abstract
The photovoltaic cell (PV) converts the solar radiation into electric energy and the current coming out of the photovoltaic cell is of the direct current type. The external power of the PV system depends on solar radiation (G) and cell temperature (T). The method of using photovoltaic cells (PV) is efficiently known by the method of tracking the maximum power points (MPPT) using the PID console. This paper introduces MPPT controllers and is a traditional Relative Integration derivative (PID). The work to simulation and modeling to PV cell by MATLAB program. The results show the relationship of curve IV and V-P of the PV panel, as is the case with changes in cell parameters and environmental parameters (radiation and temperature). Optimize PV results for maximum power and maximum voltage using the PID controller used. According to the results, observe the best PID control if compared with other MPPT algorithms.

Key words: Photovoltaic cells (PV), Maximum power point (MPPT) tracking, Proportional Integration Derivative (PID), solar radiation (G) and temperature (T).

Effect of using engine oil waste on the characteristics of asphalt binder

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Summary
Recycled asphalt mixtures (RAM), which are obtained by mixing reclaimed asphalt pavement (RAP), virgin bitumen and mineral additives, grant a range of advantages, consisting of useful resource recycling, rate reductions in costs, and decreased terrible environmental impacts. However, more than one organizations have expressed issues about the utilization ratio of RAP. The principle feature of this learn is to describe and evaluate materials of modified asphalt binder mixes by the use of Fourier Transform Infrared Spectroscopy (FTIR).

This study aims to analyze the effect of waste fuel oil WFO on the characteristics of asphalt binder using Fourier transform infrared FTIR spectroscopy.

 The findings of the treatise indicate that the good validity will add a lot of waste oil. This also offered a method for developing oils to create new rejuvenating agent to achieve complex synergism etc. In addition, the waste cyclic consumption and protection of the environment would be realized

Boiling Heat Transfer in a Micro- Channel Complex Geometry

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ABSTRACT

"This prediction demonstrates an inclusive investigation on" single-phase and two-phase pressure drop properties and flows boiling" instabilities in micro-channels to resume the concepts in the boiling heat transfer tests". The predictions of "single-phase and two-phase heat transfers" in the aluminum micro-channel heat sink have been investigated". "Different heat fluxes and different mass fluxes have been applied "(each mass flow rate under numerous heats fluxes) in an aluminum parallel channel test piece is tested". "It was built up from a piece of aluminum," twenty-five mm wide by twenty-five mm long and ten mm high"."R113 working fluid temperature was constant (25℃) for all prediction tests; "Therefore the heat applies have been applied "in the ranges of (40-600 Watts) "The processes and iteration loops have reached for the prediction heat transfer properties "for three mass flow rates are (0.0125;0.015 and 0.0175 kg/s) "respectively;" and another heat transfer properties . "The aluminum micro-channels heat sink" with 0.5 mm channel height and 0.5 mm channel width "is heated via a wire electrical heater device" ."The single-phase and two-phase flows are important parameters" for geometrical configuration of the aluminum micro-channels under variations heat applied". The purpose of this investigation is to explore the relationship between "prediction heat transfer coefficients and mini-scale heat sink geometrical configuration". Heat-transfer coefficients and pressure drops are investigated"." For sub-cooled and saturated boiling data acquired with Single-phase and boiling flows," The single-phase consequences are seen to be location-following, regular with a fully developed laminar flow. All the prediction boiling heat transfer coefficients are seen to have reasonably relied on as mass fraction and mass flux"."" Nevertheless, some are seen to have relied on heat flux whereas others are not. The convective boiling consisting is seen to have a boiling heat-transfer coefficient that is moderately relied on mass flow rate, gas mass fraction, and heat applied"." The prediction work presented here provides one of the first investigations into how to get single-phase" and two-phase properties" data via computer programming .In the end, "the single-phase and two-phase" heat transfer coefficients are reported" for square aluminum micro-channels heat sink under" boiling tests".

Keywords: *Prediction Heat Transfer Coefficient, Exit Quality, Single-Phase Flow, Two-Phase Flow, Prediction Fluid Temperature*

Free vibration and Flutter Stability of Interconnected Double Graded Micro Pipes System Conveying Fluid

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Abstract— Functionally gradient materials and small-scale pipes have a great important in industry because of its wide applications in many engineering fields such as, fluid transport in fluidic devices. The aim of this work is to study the dynamic stability of double FGM micro pipes conveying fluid depending on a modified couple stress theory. The two micro pipes are connected together continuously through elastic spring. The vibration equations with boundary conditions are acquired based on Hamilton's principle and subsequently, solved by Galerkin's method. The results of this research were compared with results reported in the literature. A reasonable agreement was found. Also, the influences of a gradient index of the material, a parameter of a length scale, the outer diameter of micro-pipe on the critical flow velocity and resonant frequencies are discussed. The results displayed that the critical velocities and natural frequencies are increased hastily with an increase in a gradient index n

Keywords— Critical flow velocity, graded double micro Pipe conveying fluid, Galerkin's method, Natural frequency.

Biodiesel production from spirulina microalgae oil

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Abstract. The present study, experimentally aimed to extract oil form spirulina microalgae then convert it to biodiesel via transesterification process. Different samples are collected from various locations. The samples are cleaned, dried and prepared for the process of oil extraction by soxhlet apparatus. The transesterification process is used to produce biodiesel fuel derived from spirulina microalgae oil, which is then used as an alternative fuel in diesel engine. The methanol along with sodium hydroxide as base catalyst used to minimize the raw oil's FFA content. The transesterification reaction is carried out at (1:6) oil to methanol molar ratio. Then the mixture is kept inside the separating funnel for 12 hours to separate the glycerine from mixture. The produced biodiesel algae methyl ester (AME) is subjected to gas chromatograph analysis as well as FTIR analysis. All the physical properties are measured and compared with ASTM standard.

Keywords: Spirulina microalgae, oil extraction, transesterification process, AME

The Effects of Honeycomb Parameters on Transient Response of an Aircraft Sandwich Panel Structure

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In this paper, an experimental and numerical investigation were conducted to develop an understanding of the importance and role played by honeycomb design parameters in transient response of aircraft sandwich with honeycomb core under the transient load. Forced vibration under transient load test was implemented on sandwich panel with honeycomb core specimens. Vibration rig with specific equipment was manufactured. Finite element simulation for the sandwich panel with honeycomb core were developed and analyzed by Ansys software package. Modal analysis and transient response analysis have been carry out to obtain the numerical transient response. The obtained results show a good agreement between above approaches with conformity by 85% percentage. The core high, cell size and cell wall thickness were selected to explore the effect of honeycomb parameters on the transient response of sandwich structure. In order to obtain the optimum condition, Response Surface Methodology (RSM) was used. Results showed that minimum transient response were found at 20 mm core height, 25 mm size cell and 1.5 mm cell wall thickness. Where, the optimal value minimum transient response equal to 0.0019 mm.

Keywords:- aircraft sandwich panels, honeycomb core, vibration, transient response, optimization and surface methodology

Study the effect of cold working on the mechanical properties of aluminum alloy 2024 T4

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Abstract

This paper studied the effect of cold working process on (AA2024-T4) .shot peening and burnishing processes were utilized in this work . different times of peening (2, 4, 6,8,16 and 24 min) and two parameter of burnishing process (feed rate , spindle speed) were used to analysis the effect of these processes on the mechanical characteristic of aluminum alloy 2024 T4 . Fatigue strength , surface hardness and surface roughness were studied . It was observed the shot peening and burnishing process leads to improve fatigue strength of AA2020 T4. The best value of fatigue strength   (219 MPa) was obtained in burnishing process at spindle speed (720rpm) and constant feed rate (0.1) . This improvement in fatigue life due to compressive residual stresses introducing on alloy's surface .The highest vales of surface hardness and roughness were(394HVN)) and (8.1 μm) that obtained at (24min) times of shot peening process .

KEYWORDS: fatigue strength , cold working , AA2020 T4 , surface roughness, surface hardness

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Improving the performance of air conditioning system experimentally by a new type of heat pipe heat exchanger

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ABSTRACT

The air conditioning system efficiency is measured by it is coefficient of performance (COP). Higher COP means better system. However, the improving of COP is not an easy work since it linked the heat rejected by the system to power consumed by mechanical part in system, especially the compressor. In this study, a smart employing of heat pipe heat exchanger (HPHE) is used to reduce the power consumed by compressor through super heating the refrigerant vapor pre-enter the compressor and improve the cooling capacity. The results show that using (HPHE) improves the COP of the system by 10% compared to other conventional system.

Key words: HPHE, COP, Air conditioning, Two phase heat exchanger, Gravity assist heat pipe heat exchanger.

The influence of dust physical specifications photovoltaic modules performance

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Abstract
In this article, an experimental analysis was performed to assess the effect of dust accumulation on PV modules resulting energy losses. The dust used in the experiments was collected from three specific sites in the Republic of Iraq. Samples of pollen and common dust were collected from three sites for a period of three months in order to assess their physical properties.
The results showed that 64% of all dust particles are 2 to 62 μm in diameter. The effect of dust deposition on the PV modules has mixed results from one location to another. The surface mass of the precipitated dust is concentrated on the PV unit only (up to 5 $g/m^2/day$), and the decrease in the energy results was evident. The daily maximum decrease in efficacy was 0.05% for the samples examined, and when compared to neighboring countries its value is clear and effective. The results showed that the exposure of the photovoltaic cells to external conditions for a period longer than two months caused a decrease in the productivity of the photovoltaic unit by 35-40%. Therefore, it is recommended that there be periods of cleaning the cells up to two months. The study concluded that the use of PV systems in the studied sites is a practical and economical option.
Keywords: Dust deposition; pollutant type; physical properties; photovoltaic

Experimental Study For The Effect Of Using Nano-Fluid On Heat Transfer Through The Flat Plate Solar Collector

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Abstract

The aim of this Paper is studying experimentally the effect of utilizing (Al_2O_3/water) Nano-fluids as the factor of heat transfer on performance of the flatplate solar collector. The project's work focuses on the process of transferring energy from the solar collector to the fluid that passes through the tubes. This is done first by using water as a basic agent fluid and then by using Nano-fluids as a working fluid.This study was experimentally using manufactured solar collectors. Experimental tests consist of [a solar collector, unit control, a working fluid system, and measuring devices (thermometers, LM35 Temp. sensor, flow rate meter, Solenoid valve and solar meter)] Sensors and measuring devices were connected to the Arduino as a control system, linked to a personal computer, and using the Labview program to take the results and export them to Excel. Experiments were conducted in Iraq - Babilon Governorate, AL-Shomali City with the latitude of 32.4^o by using (Al_2O_3-water and TiO_2-water) Nano-fluid as a working fluids, used the volume fraction as (0.3 and 0.6) % and a particle size is 50 nm with working fluid flow rate (1.50) L/min. Experimental results shows that's a maximum output and inlet temperature variance is obtained (0.6 vol. %) Nano-fluid for Al_2O_3/water is (14.6 C) at flow rate: 1.5 L/m Whoever in the case of water, the maximum temperature difference was at the outlet (10.2 0 C) at flow rate :1.5 L/m. The Collector efficiency enhancement of 0.6% vol. for (Al_2O_3/water) Nano-fluids are (20.5 %. Also, the results show, the enhancement in a thermal conductivity with an addition small size from the (Al_2O_3) nanoparticle with 0.6% vol. to the water increasing by (8.34) %.

All experimental results were showed that a degree of heat coming out of the solar system increases when water is used with Nano-particles, especially when concentrated 0.6% vol. Also, Al_2O_3 shows high heat transfer compared to pure water, this lead to improve the performance of the solar fat-plate collector. Where its value exceeded the value of energy using water by a percentage 10.15%

Keywords: flat plate, Nano-fluid, flow rate, LabVIEW, Solenoid valve .

Effect of revolution speed on the mechanical properties of dissimilar Aluminum alloy joined by friction stir spot welding

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ABSTRACT

Friction stir spot welding (FSSW) method was performed for welding of aluminum alloys AA6061-T6 with pure aluminum AA1100 sheets having thicknesses of 2.4 and 3 mm respectively. FSSW procedure was accomplished at varied tool rotational speeds (1000, 1600, and 2000 rpm). The dwell time was (2, 4, and 6 sec) and the geometry of the tool pin was threaded cylindrical pin with a cylindrical and straight shoulder.

The aluminum alloy AA6061-T6 sheet was overlapped on the pure aluminum AA1100 sheet. The tensile shear test was investigated for all specimens. It was deduced that the value of the maximum shear force is 1.95 kN. This value was obtained at the following welding factors: 2000 rpm spindle rotational speed, 4 sec dwell time and threaded cylindrical pin profile, the two other factors which were pin length and plunging time were kept as constant parameters through the tests at 3.2 mm and 40 sec respectively. It was also concluded that the fracture happens in the nugget zone mode at the highest lap-shear load.

KEYWORDS: friction stir spot welding; shear force; aluminum alloys

Effect of half circular obstacles in duct on natural heat transfer: numerical study

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Abstract

The natural heat transfer in ducts depend on generating an induced flow due to the difference in density between the heated fluid and it is environment. The effect of reduce cross sectional area of a vertical isothermal duct by adding half circular obstacles to the inner side of the duct. The effect of the induced flow and obstacles were study using COMSOL software and compared to heat through same duct with no flow. The results that obstacles increase induced flow by 16% compared to normal vertical duct, Also shows a reduction in value of the maximum temperature of the hot surface at the solar peak heat flux (3:00 PM).

Keywords: Natural convection, induced flow, duct flow, obstacles.

Nomenclature

H   height of duct (m)

W   width of the duct (m)

T_H Temperature of hot surface (C)

T_C Temperature of cold surface (C)

T_0 Ambient temperature   (C)

u   velocity component on x-direction (m/s)

v   velocity component on y-direction (m/s)

g   gravitational acceleration (m/s^2)

k   thermal conductivity   (W/m K)

p   pressure   (N/m^2)

c_p specific heat (J/kg.K)

ρ   density of fluid (kg/m^3)

μ   dynamic viscosity (kg/m.s)

β   volumetric of thermal expansion (K^{-1})

Simulation Nonlinear of Structural Behavior of Hollow Reinforced Concrete Deep Beams Strengthened By CFRP.

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Abstract

Deep beam is adopted in many structural buildings and especially in high rise buildings and bridges in the form of transferee girder. Deep beam is primarily loaded in the plane of the member, such a beam is a two-dimensional member in a state of plate stresses whose dominant feature is shear. The beam theory is not applied on this type of beam. In the current paper, five models that represent reinforced concrete deep beam are simulated using finite elements approach by ANSYS to evaluate the full performance under the effect of four-point load. Controls with four models contain longitudinal perforations amending by carbon fiber reinforced polymer CFRP to restore the strength of deep beam without openings. Different parameters are considered such as openings geometry, CFRP layers and CFRP ordination. The result of the analysis indicates that the finite element approach that is applied for analyzing is close to the experimental test. The presence of CFRP restores the strength capacity of deep beam and the failure mode of the deep beam for all models is shear failure.

KEYWORDS: Deep beam, CFRP, Finite elements, ANSYS, Perforations, Re-strengthening.

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KEYWORDS: Deep beam, CFRP, Finite elements, ANSYS, Perforations, Re-strengthening.

NOMENCLATURE

Symbol	Description
A_f	C FRP external reinforcement,(mm^2)
A_{fv}	CFRP shear reinforcement with spacing s, (mm^2)
A_s	Area of steel reinforcement, (mm^2)
c	Distance from extreme compression fiber to the neutral axis, (mm)
d	Distance from extreme compression fiber to the neutral axis, (mm)
d_f	Depth of FRP shear reinforcement, (mm)
E_f	Tensile modulus of elasticity of CFRP, (MPa)
fc'	Specified compressive strength of concrete, (MPa)
f_{fe}	Effective stress in the CFRP; stress level attained at section failure, (MPa)
h	Overall thickness of a member, (mm)
k_1	Modification factor applied to κv to account for the concrete strength
k_2	Modification factor applied to κv to account for the wrapping scheme
L_e	Active bond length of CFRP laminate, in. (mm)
Mn	Nominal moment strength, (N-mm)

s_f	Spacing FRP shear reinforcing as described in, (mm)
t_f	Nominal thickness of one ply of the CFRP reinforcement, (mm)
V_c	Nominal shear strength provided by concrete with steel flexural reinforcement, (N)
V_n	Nominal shear strength, (N)
V_s	Nominal shear strength provided by steel stirrups, (N)
V_f	Nominal shear strength provided by CFRP stirrups, (N)
w_f	Width of the FRP reinforcing plies, (mm)
α	Angle of inclination of stirrups, degrees
β_1	Ratio of the depth of the equivalent rectangular stress block to the depth of the neutral axis
ε_{fe}	Effective strain level in CFRP reinforcement; strain level attained at section failure, (mm/mm)
ε_{fu}	Design rupture strain of FRP reinforcement, (mm/mm)
κ_v	Bond-dependent coefficient for shear
ψ_f	Additional CFRP strength-reduction factor

Pitch angle control using neural network in wind turbines

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Abstract

Wind energy is a growing renewable energy resource. Wind power can be improved or restricted by adjusting the pitch angles of the wind turbine blade. The wind turbine model is non-linear. Therefore, a smart controller must be designed to adjust the angles of the blade. In this study, the simulated and code method was with the MatLab program to control the angle between the chord line of the blade and incoming wind direction using a type of the neural network (NN) control. The results from the simulation show that the NN proposed controller is very effective for adjusting the pitch angles.

Key Words: Wind energy, NN control, pitch angles and MatLab program.

Compressive Strength Development of Slag-Based Geopolymer Paste Reinforced with Fibers Cured at Ambient Condition

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Abstract

Geopolymer mixtures (such as concrete, mortar, and paste) were used as sustainable alternatives to Portland cement, and enhancement the mechanical properties by addition fibers, due to their great potential in reducing environmental pollution and reducing consumption of raw materials. In this paper, verified the effect of different fibers added to slag based geopolymer paste, on compressive strength development. Ten mixes were preparing and curing at ambient condition. The variables included; type of fibers added (i.e. micro steel fiber, carbon fiber, or polypropylene fiber), and volumetric ratio of fibers included, (1%, 2%, or 3%) of micro steel fiber, and (0.2%, 0.4%, or 0.6%) of carbon fiber and polypropylene fiber. The alkaline solution was combination of sodium silicate (Na_2SiO_3), and sodium hydroxide (NaOH) with concentrically 10 molar. The results were found that the addition of fibers led to improving significant of the compressive strength. Generally, the development of compression was estimate by about (30% and 23%) at ages (7 and 28) days, respectively. Finally, the slag based geopolymer paste is more suitable to use in construction sites as alternative sustainable of Portland cement.

Keywords*: slag, geopolymer paste, fibers, compressive strength, and ambient curing.

COMPRESSIVE BEHAVIOR OF CONFINED RC COLUMNS BY FIBROUS JACKET

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Abstract.

The current study conducted to examine the effect of strengthening of RC square short columns with fibrous jackets. Experimental and theoretical study included fabrication 16 column, seven columns were fabricated experimentally and ten parametric columns were modeled theoretically by ANSYS software. The parametric study included testing of two series of columns under axial compression load. The first series included eleven small scale columns retrofitted by fibrous jacket reinforced by were fabricated experimentally and theoretically with many variables such as jacket thickness, strengthening type (hoop and composite), vertical and inclined rebar, in addition to columns with larger length. The second series included testing of five full scale-columns modelled numerically and strengthened with composite and hoop fibrous jacket with different jacket thicknesses. The test results showed that the fibrous jacket enhanced the stress capacity, ductility, toughness, deformation capacity, and energy absorption. Increase the jacket thickness (25 to 45 mm) increased the ultimate load carrying capacity by (54%). Hoop jacket enhanced the ultimate stress capacity more than composite case by (19.7%). Concerning the theoretical side, 3D simulation by finite element analysis of ten columns with different parameters. Hoop fibrous jacketed column with inclined reinforcement enhanced the ultimate stress by (35%) while the column with reinforced jacket by both steel fibers and steel reinforcement showed less enhancement by 13%. Increase the length of the strengthened column decrease the average enhancement in the ultimate stress by (17%). Strengthening full scale columns with composite fibrous jacket with thicknesses (5, 6, and 7) cm showed an enhancement in the load carrying capacity by (177%, 210%, and 245%) respectively. Hoop jacket in the full-scale column was better than composite one which showed that the hoop jacket carried stress more than composite one by (67%) approximately.

Keywords: Square columns, fibrous jacket, jacket thickness, ductility, steel fibres, energy absorption.

DYNAMIC ANALYSIS OF COMPOSITE MULTI I-GIRDERS BRIDGE USING FINITE ELEMENT METHOD

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ABSTRACT

Three dimensional finite element models are developed to deal with the bridge-vehicle interaction problem of simply supported composite multi I-girders bridge. The bridge is modeled by using ANSYS 15.0 program with solid and shell elements to represent concrete and steel members, respectively. AASHTO HL-93 truck is idealized as 3D non-linear model consisting of five lumped masses connected by rigid beams and supported by spring-dampers. The separation between the tires and road surface and surface roughness condition are simulated by Gap and actuator elements, respectively. The road surface roughness profiles are generated from power spectral density (PSD) and cross spectral functions. The models used are capable to take all bridge and vehicle responses into consideration with no limitations on the complexity of the models. The dynamic responses of the multi I-girder bridge are investigated under conditions of various loading positions, roughness classes, vehicle speeds, and bump height. The dynamic behaviors are presented in terms of Dynamic Amplification Factors (DAF). The results show the girder that itself supporting the moving vehicle has lower value of DAF because of higher static responses. A 45 km/hr vehicle speed provides higher DAF value. The bump heights have significant effect on DAFs for bridge with short span.

KEY WORDS: Composite I-girder Bridge; FEM; ANSYS; Road Surface Roughness; Interaction system; Dynamic Amplification Factors.

Impact of Design Requirements for Facade Formation on the Functional Performance of the Balcony Space in Residential Apartments

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Abstract. Balcony is considered to have two main functions in design process of residential building. The balcony has a function to form important internal space for many activities, which are necessary for the family. This space connects the family in its housing with its surrounding area. Thus, design of balcony space requires criteria and determinants to enhance its performance as a space for residence and as a connection part between the internal and external environment. On the other hand, the balcony is a basic element of the façade composition. Designers usually use it to give the required external formation to residential buildings. This formation adds design requirements, which can be consistent or inconsistent with balconies function. This dual function of the balcony and the homogeneous or contradictory requirements may cause a serious design problem. Designers usually focus on the role of the balcony as a formative element of the building's façade. This may often lead to the omission of some of its basic functional roles within the housing apartment, and that reflects a whole range of functional disadvantages, especially in the sphere of economics of apartment design. This research aims to measure functional disadvantages in performance of the apartment's balcony, caused by mono focusing on the aesthetic or expressive factors. These may not correspond with total necessary determinants for balcony's acceptable functional performance.

To achieve this goal, the Newroz City residential project in Erbil was elected as a sample to conduct the necessary analytical calculations, questionnaire and personal observation to measure the functional efficiency of the balcony space in the various apartments. Obtained results represent the negative impact of omission basic design criteria for balcony space on the functional performance, due to focusing on the aesthetic factors. This may impact on economics of apartment design.

Keyword(s): Balcony, Apartment design, Affordable housing, Sustainable design, Facade aesthetics, Restoration.

Beam deflection estimation by Monte Carlo simulation and Kalman filter based ultrasonic distance sensor

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Abstract
The beam deflection estimation is of primary importance on design stage and health monitoring stage as it provide an indication about the failure of the structure. The bending theory based model is a deterministic model that widely used to determine the beam deflection theoretically. Two significant factors are influenced the beam deflection estimation in bending theory, the applied load and cross section dimensions. Taking the uncertainty of these two factors into account provide an opportunity to understand the uncertainty of the beam deflection estimation. In this paper the so called Monte Carlo Simulation (MCS) is used to create stochastic bending model from bending theory model by generating random load and random cross section dimensions based on the accuracy of measurement devices. On the other hand, the beam deflection can be estimated experimentally within a specific accuracy depending on the accuracy of measuring device. A validation tool is needed to combine the experimental and theoretical results in one model to obtain a more accurate estimator than using experimental results alone or theoretical deterministic model alone. In the present work the Kalman filter (KF) is used to put together the experimental results from a cheap distance sensor (ultrasonic distance sensor) with bending theory results to estimate the deflection of simply supported beam. The KF algorithm taking into account the uncertainty of process and the uncertainty of the sensor, resulted in robust estimation of beam deflection.

Keywords: Beam deflection, Stochastic estimation, Kalman Filter, Bending Analysis, Ultrasonic sensor.

Simulation and Comparison of Modeling of Photovoltaic Modules During Different Values of Solar Irradiations Whilst Temperature of twenty five degree Celsius

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Abstract

In this paper, a simulation by MATLAB code lines has been done for modeling of three types of mono-crystalline silicon photovoltaic modules by using single diode diode models. The three types of photovoltaic modules are DelSolar D6M195B2A, EPOLLY ep125M/72-195W and LDK 195 MC. The MATLAB simulation has been done by using the data provided by the commercial datasheets. In this paper, three types of photovoltaic modules have been modeled by MATLAB simulation at diverse values of solar irradiations (G) whilst temperature (T) equal to 25°C. A current-voltage (I-V) characteristics curves with regard to photovoltaic modules have been plotted by using MATLAB simulation at different values of G are 100, 400, 700 and 1000 W/m², whilst T of twenty five degree Celsius. It has been noted from simulation results that during the changing of values of G for three photovoltaic modules leads to change the values of short circuit current (Ish) for each photovoltaic module. The simulation results of modeling of EPOLLY ep125M/72-195W photovoltaic module have been presented that the changing of values of G leads to small changing of values of Ish. Whereas, the simulation results of modeling of DelSolar D6M195B2A and LDK 195 MC photovoltaic module have been presented that the changing of values of G leads to changing of values of Ish, and that changing is bigger than case of EPOLLY ep125M/72-195W photovoltaic module. It has been concluded that EPOLLY ep125M/72-195W photovoltaic module is more suitable to be used during the regions that have frequently changing of values of G than using DelSolar D6M195B2A and LDK 195 MC photovoltaic module.

Keywords: Photovoltaic (PV), Short Circuit Current (Ish), Open Circuit Voltage (Voc), Solar Irradiations (G), Temperature (T)

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Vehicle Speed Reduction Based on Authorized Speed Limits

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Abstract: - Keeping vehicle speed under control according to the speed limit is considered the main key to the traffic departments in the world to reduce vehicle accidents. This paper presents a prototype of a novel idea to control vehicle speed automatically according to the types of roads that the vehicle passes through without human intervention. The Micro-controller unit is interfaced with the RF receiver at the prototype, also with the RF's transmitters deployed along the hypothetical pathway. The results show a valuable response for controlling a vehicle's speed according to the speed limit of different types of roads.

Keywords *Micro-controller, GPS, GIS, RF*

Experimental study of steel-concrete composite beams with slab opening

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Summary
This study investigates experimentally the effect of openings in the concrete slab of the composite beams. Composite beams consisted of concrete slab connected with steel I-beams by steel headed stud connectors is used in the study with eleven specimens. The test specimens are designed to test and failed in flexure. The test specimens are classified depending on the variable parameters into the following groups: control sample; opening ratio; ratio the short to the long dimension of opening; thickness of the concrete slab; grade of compressive strength; strengthen of opening by steel plate. The results of the study indicate that the general trend in the ultimate load is to increase with increasing thickness of the concrete slab and increasing the compressive strength of concrete. While the ultimate load decreased when increasing the opening ratio because decreasing the effective width of the concrete slab and the cracks develop when the opening was near to the applied loads. Also, the distribution of shear connectors in place of opening on both sides and present the diagonal reinforcing rebars about the opening minimize from the significant decrease for the ultimate load.

Keywords: Steel- concrete composite beam; slab opening; Opening in concrete flange

Simulation and optimization of Camelina oil fatty acids reaction to produce fatty acid methyl esters in a reactive distillation reactor

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Abstract

Reactive distillation (RD) is a chemical unit operation in which chemical reaction and product separation occurs simultaneously in one unit resulted in reduce the number of downstream steps, energy savings, and greenhouse gases. In the current work, process flow sheets for industrial routes for conversion of camelina oil fatty acids to fatty acid methyl esters (biodiesel) in presence of acid catalyst is modelled in Aspen HYSYS for the purpose to scale up the esters production. The effect of the operating and design parameters is optimized in addition to design the production plant. The simulation results showed that optimum ester yield is obtained for linoleic acid and palmatic components using 6:1 alcohol to oil ratio, reaction temperature $60^{o}C$ and feeding the oil and the alcohol at stage number 3 and 5 respectively.

KeywordsP Camelina oil, fatty acids, esterification, simulation, optimization

Simulation and optimization of Camelina oil fatty acids reaction to produce fatty acid methyl esters in a reactive distillation reactor

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KeywordsP Camelina oil, fatty acids, esterification, simulation, optimization

Fatigue Characterization for Composite Materials used in Artificial Socket Prostheses with the Adding of Nanoparticles

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Abstract. The prostheses sockets use normally composite materials which means that their applications may be related with the human body. Therefore, it was very necessary to improve the mechanical properties of these materials. The prosthetic sockets are subjected to varying stresses in gait cycle scenario which may cause a fatigue damage. Therefore, it is necessary or this work to modify the fatigue behavior of the materials used for manufacturing the prostheses sockets. In this work, different Nano particle materials are used to modify the mechanical properties of the composite materials, and increase the fatigue strength. By using an experimental technique, the effect of using different volume fractions for various types for Nano particle materials on the fatigue behavior for composite materials, and preparing the fatigue samples and tested using the fatigue apparatus. The Nano particles used were (Nano SiO_2 and Nano Al_2O_3) materials with volume fraction as (0% to 2%), for each type of Nano material used. The artificial neural network technique was adopted to have a verification for the experimental results and calculating the fatigue life and strength for composite materials, with the addition of nanoparticles and then, a comparison of the results was achieved. The comparison of the results indicate a maximum error between results calculated by two technique did not exceeded about (1%). Then, the results calculated showed that the mechanical properties and fatigue life and strength increase with reinforcement with Nano particle. Also, the results showed that the modified for fatigue limits with materials by (Nano SiO_2) Nano particle was more than the modified for fatigue limits for materials reinforcement with other materials. Finally, it can be concluded that the modified for fatigue strength, by reinforcement with (Nano SiO_2), leads to 60% more than fatigue limit without Nano additive.

Keywords: Fatigue Behavior, Composite Materials, Nano Additive, Prosthetic.

Optimum Design of Reinforced Concrete One-Way Ribbed Slabs Using Genetic Algorithm

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Abstract

This paper deals with the problem of optimum design of reinforced concrete one-way ribbed using genetic algorithms. ACI-Coefficient method is used for the structural analysis and design of slabs. The cost function represents the cost of concrete, steel, and formwork for the slab. The design variables are taken as slab thickness, spacing between ribs, lower width of ribbed, upper width of ribbed, depth of rib, depth of beam, shear reinforcement spacing of ribs, bar diameter and spacing of top slab, depth of the neutral axis from bottom fiber, beam width, and areas of flexural reinforcement at moment critical section along ribs and beams. The constraints include the constraints of the joist construction constraints stated by ACI-code, constraints on the top slab thickness to satisfy fire resistance, constraints on the areas of steel reinforcement to satisfy the flexural and the minimum area requirements, the constraints on the total slab thickness to satisfy deflection, and flexural behavior. The parameters were taken in this study included: the span length(4-12)m, the compressive of concrete(25-60) MPa, the strength of steel (345-600)MPa, the live load (2-7)KN/m2, unit cost ratio(cost of concrete/cost of steel)(0.1-0.35), aspect ratio (1-2), the formwork cost(10,000-22,000)I.D. The results show that, when discussed the span length, the ratio of (total slab depth/span length) should be (1/18-1/4) using G.A, to get the optimum slab design. It is also concluded that the optimum ratio of (depth of rib/lower rib width) is to be ranged within (1.243-2.917) using G.A. The optimum (rib spacing /span length) ratio is found to be ranged from (1/40– 1/5) using G.A, the results also showed that the range of the optimum (slab thickness/spacing of rib) ratio is found to be ranged as (1/4-1/2) using G.A, in order to find the optimum solution.

A computer program is written using MATLAB for the implementation of structural analysis and the design of one-way ribbed slabs by the ACI coefficient method. The optimization process is performed using the built-in genetic algorithm toolbox of MATLAB.

KEYWORDS: ribbed slab, optimum design, genetic algorithm

Numerical Study of Condensation Heat Transfer and Droplet Dynamics on Different Wetting Surfaces of Gas Transportation Pipelines

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Abstract

In this work, numerical investigation of condensation on a horizontal pipe which has various wettability properties analyzed. The influence of droplet size and contact angle on the performance of heat transfer is investigated. The condensation heat transfer obtained using MATLAB software to find the optimum function that enhances the performance. The wetting behavior is discussed under the atmospheric condition by considering the non-condensable gas. The effect of thermal boundary layers resulted from the droplet conduction, interfacial, coating, non-condensable gas, convection heat transfer was considered as well. The heat transfer rate is influenced by the droplet diameter for both hydrophilic and hydrophobic surfaces. The heat transfer rate increased by 30% when the droplet diameter is 1.5 mm than the droplet diameter is 2.5mm. The contact angle has affected the performance of heat transfer on hydrophilic surfaces.

Keywords: condensation, hydrophilic, hydrophobic, droplet diameter, contact angle, heat transfer rate.

Prediction of Pavement Condition Index for the highway road between Ba'Quba and Tuz Khurmatu of Iraq: A new model suggestion.

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Abstract

Pavement condition index is an important indication for road performance and safety driving. Abuse of highway roads always resulted in may difficulties like improper driving, long time of trips, travelers discomfort and many other problems. Uncontrolled traffic of heavy loaded trucks together with high temperatures and absence of road maintenance will certainly cause huge damages to asphalt pavement and as a result reduced road lifetime. In this paper an attempt was made to assess the necessary parameters that used to model pavement condition index by the use of bootstrapping via the SPSS ver. 23. The estimated parameters showed a reasonably reliable predictions when compared to actual data.

Keywords: Pavement Condition Index, Estimation, Prediction, performance degradation

Synthesis of Nano Platinum-Tungsten Supported on Gamma-Alumina Catalyst

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ABSTRACT

Nano gamma-alumina support was prepared successfully by Sol-gel method using aluminum nitrate without and with carbon nanotubes as a template at different calcination temperatures (600, 650, and 700°C) and then loaded with 0.3% of platinum and 0.3% of tungsten by the wet-impregnation method. X-ray diffraction (XRD), thermal gravimetric analysis (TGA), atomic force microscope (AFM), field emission scanning electron microscopy (FE-SEM) and (BET) surface area were used to characterize the prepared nano catalyst. The best results obtained were 389.34 m^2/gm surface area, 0.468 cm^3/gm pore volume, 8.07 nm pore size and 42.71 nm average particle size for the prepared nana gamma-alumina at a calcination temperature of 600°C.

Keywords: Gamma-alumina, Carbon nanotubes, Sol-gel method, Wet-impregnation method.

MICROSTRUCTURE CHARACTERIZATION OF(Ni-P-AL2O3) ELECTROLESS COATING OF LOW ALLOY STEEL (AISI 4140)

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ABSTRACT

In This paper investing micro hardness, surface roughness measurements of electro less composite of coatings (Ni-P- AL$_2$O3). deposited in electro less immersion on low alloy steel. All Specimens (20 mm diameter $\times$ 10 mm height) were used as the substrates for low alloy steel (AISI 4041). were grinded and polished as ASTM by emery paper (tungsten oxide paper) no (400–2500). then samples were washed by distilled water and ethanol and dried by using an electrical dryer. Polishing was conducted by diamond paste, specimens were immersed in acetone for (60 min). Before coating, specimens were immersed in solution including materials (30 g/L NaOH, 60 g/L NaCO3 and 60 g/L NaPbo4) for two-minute period at(75ºC) temperature moving the electrolyte using magnetic stirring by supply power (3 volts) to remove oil and any dust from metal surface. After that, the specimens were washed with distilled water, and Placed in sulfuric acid solution (20%) for (10 sec) .after that it directed immersion in coating solution . The electro less (Ni-P-AL$_2$O3) coatings were prepared by using nickel chloride as a source of nickel in alkaline baths, using (alpha alumina).The formulas were characterized by means of measurements of micro hardness, surface roughness .Our the results revealed that the heat-treated sample (Ni-P-AL$_2$O3) showed higher hardness (2061HV). Increasing   in the concentration was noted of (AL$_2$O3) induced as-coated(Ni-P) conversion structure from amorphous to crystalline. The composite coating (Ni-P-AL$_2$O3) is better compared to the Ni-P coating, and they get even better with heat treatment increased. The addition of (AL$_2$O3) makes the coating denser and the grain size to decrease according to the formulae being heat treated.

KEYWORDS:

Electroless Ni–P–AL$_2$O3 Coating, Micro Hardness ,Surface Roughness

Improvement and Assessment of Bab Al-Hussein signalized intersection in Hilla city

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Abstract. Increasing traffic loads at intersections is among the major issues causing traffic difficulties and then leads to traffic jams in the following infrastructures, such as the highways and their crossings are the reflection of civilization across every country. And the scale of the progress throughout the highway quality, number and the traffic facilities in the intersection. The stated objectives of this research are to improve and assess the traffic efficiency of the signalized intersection at Bab Al-Hussein in Hilla City, which matches the current situation and spatial characteristics of the intersection. Traffic volume data have been collected for each approach and every movement (Through, Left, Right and U-turn) within peak hour volume in the (a.m. and p.m.) period for the intersection. Traffic volume classification was according to vehicle's type which they are moving to throw the intersections (passenger car, heavy vehicle, motorcycle) In addition to the volume of the pedestrians. Data were collected by using the technique of video recording method then represent in tables and figures. The program SYNCHRO 8 has been utilized to analyze and assess the intersection and to select the optimum alternative. The assessment process results in application of the intersection with service standard (LOS F). Because of recommendations for various solutions, varying from signal optimisation to geometrical enhancements. The study conducted that, when add one lane in each approaches and minimizing the cycle length to (75) sec, thus the service level will be increase from (F to C) LOS. This result is an economical and acceptable solution to increase intersection performance. It was recommended that U-turn be prevented because it causes traffic delays, and thus the lost time increases. From it the traffic volume increases at the intersection also, preventing heavy vehicles from crossing at peak times and allocating a time from 6:00 pm to 6:00 am with the allocation of a special road to cross them, because it obstructs traffic and the risk of their presence in a busy intersection.

Keywords: intersection, signalized, delay, synchro, cycle length.

Economic, Social, and Environmental Sustainable Operation of Roadways within the Central Business District (CBD) sector at Hilla City Incorporated with Public Transport

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Abstract. The maintaining of sustainability is a constant challenge. Sustainability can be achieved by maintaining road traffic safety or preventing collisions and using pollution-free vehicles and safe transporting of goods. This research addresses the assessment of measuring transport sustainability based on economic, social, and environmental indicators for public transport routes. The methodology of this research can be described by collecting data (air pollution, noise, number of incidents, and volumes of traffic) from 15 public transport links within the central business district (sector 2) in the city of Hilla through collaboration with the departments concerned. To avoid the problem of utilizing several evaluation indicators, this research is developing a procedure to obtain a sustainable composite index to available data collection. The indicators of sustainability for urban transportation addressing the economic (delay), social (safety), and environmental (noise, air pollution) aspects depend on existing data. Indicators are combined in the economic, social, and environmental indicators into a composite sustainability index, in a way that overcomes the restrictions of normalization, weight, and aggregation. It is an attempt to estimate the sustainability of transport within the CBD sector No.2 in Hilla, which is integrated with public transport. According to the ICST (Composite Sustainability Transportation Index) value for roads associated with public transportation in Sector No.2 of the CBD Hilla City, the overall assessment for sustainability operation is from moderate level (9 links) to low (5 links) and a high level (1 link).

Keywords: Indicators, Noise, Public Transport, CBD, Sustainable Operation, Traffic Safety

Flat solar air heater collector with phase change materials for domestic purposes in Iraqi climate

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Abstract. In this study, a solar air heater was built and flat in shape, one with a black plate to gain heat and the other was placed by a tank under this plate containing paraffin wax to increase thermal storage. Energy and exergy for air heater were also analyzed. The performance of heat air heaters was analyzed by measuring various variables such as the intensity of solar radiation, the ambient temperature, the temperature of the air inside and out of the heater, and thermal efficiency. The maximum thermal efficiency of solar heater with PCM is 16.3% compared to normal heater which was 12.4%. The addition of paraffin wax to the air heater caused an increase in the duration of air heating. The maximum exergy effectiveness of a flat solar air heater collector with heat storage materials (PCM) is 0.7%.

Performance study of single cylinder engine dual fuel (diesel + LPG)

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Abstract

Diesel engines efficient and economical large, but at is large in size and non friendly environmental. LPG is available at a lower price than other fuels and environmentally friendly. One of the important research topics that have been updated is the use of LPG in diesel engines. The LPG has a high heat value, and its gaseous state makes mixing with air simple and has perfect redound of combustion to increase the power output also the LPG helps to fully consume the fuel and thus reduces emission and helps to harvest the total energy found in the fuel. It was designed a new Electronic Control Unit (ECU) and used of the LPG injection timing and duration while opening the air intake valve into the combustion chamber and a magnetic sensor is installed on top of a single cylinder diesel engine with air-cooled. The test engine was run in four fuel mode the start was used is D-100, after that the fuel was used LPG-25, LPG-50 and LPG-100. The test was under loads 0%, 25%, 50%, 75% and 100% at different speeds 1000, 1500 and 2000 rpm. At the engine speeds 1000, 1500, 2000 rpm compared with D-100 fuel, the thermal efficiency was better at using LPG-50 fuel were increased about by (0.99%, 0.92%, 1.29%) and bsfc were decreased as (9.81%, 9.4% and 9.68%) respectively. A decrease in emissions, NOx, HC, CO and CO2 was observed in all operating modes with LPG and the best emission reduction situation is LPG -50.

Index Terms— Diesel Fuel, Dual Fuel, Diesel Engine, LPG Fuel

THE EFFECT OF ASPECT RATIO OF ELLIPTICAL COOLING HOLES ON THERMAL CHARACTERISTICS OF GAS TURBINE BLADE

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Abstract

In advanced gas turbine, the improvement of the thermal efficiency and power output is required. Among these improvements, which still getting attention considerably, increasing turbine inlet temperature that may exceed the melting point of the blade material and to avoid that internal blade cooling technique is incorporated. The common traditional cross-sectional area of the cooling channels is circular. In this paper, a modification regarding the shape of cooling hole is suggested to enhance the heat transfer between the coolant in cooling serpentine and hot gases from the combustion chamber and thus minimizing the severe temperature usually occurs in the gas turbine blade especially at first row of the rotor. The proposed shape is elliptical and to discuss different scenarios of cooling schemes, the aspect ratio of ellipse axes and the distribution of whole holes are also analyzed to figure out the best results in terms of temperature distribution, heat transferred and cooling effectiveness of each model. The three new models consist of cooling holes of (5, 6 and 7) located at the center of the curvature line of blade. Results were compared with those obtained using the model of the GE company (model-1) which is already installed in (AL-DIWANIAH GAS TURBINE POWER PLANT). It were analyzed on the basis of real data, such as geometry profile, total cooling area, and boundary conditions. Results have been discussed and it is found that model-4 is the optimum solution, because of maximum total heat transfer rate and reduction in the blade trailing edge temperature about **24%** are attained in this model compared to model-1, and it is found increase number of cooling holes in the blade leads to lowers the blade trailing edge temperature, this depends on the design location of this holes on the blade surface. Meanwhile, the optimum ratio of the model-4 in the reduction of maximum temperature is (a / b = 2) by the dimensions of (a = 2 & b = 1). Steady state thermal analysis is carried out using CFD, Inconel 718 alloy selection as material and air is used as a coolant as the real condition of.

Keywords: gas turbine, heat transfer, temperature distribution, blade, CFD

Experimental Investigation of a Single Slope Solar Still Performance- Evaporation Process Enhancement

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Abstract
The productivity of single-slope solar still is limit due to limited amount of solar energy absorbed, and that directly affected the evaporation process. For enhancing the evaporation in solar still, two ways are experimentally investigated. The first, a specially designed solar collecting tank is used to pre-heat raw water before it inters the basin of still. The second, two sizes of iron wicks are used to increase the area of solar absorbing element inside the still. The results show that the still productivity enhanced by 86.65 % and 72.53 % in deferent types of wicks, and about 48.83% by solar collecting tank compared with conventional solar still.

Keywords: solar still, solar water distillation, evaporation enhancement, productivity enhancement, water preheat, single slope, distillation, distillate yield.

A comparative Study for Grey Water Using Ozonation and Ultrasonic Irradiation Processes.

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Abstract:
Grey water is considered a type of wastewater which bring damage to human health and environmental if disposed improperly. This lead to research an efficient treatment method to reduce the damage. The methodology used for grey water treatment was ozonation and ultra sonication . PH, ozone dose, temperature and time were the factors effecting the overall performance of the treatment process for the two forms of grey water(car wash water and Domestic water). both the COD & oil content were measured to determine the effectiveness of the process. for carwash sample ,the COD and oil content were 95%,96.5% at 0.52 mg/l ozone dose , at 55 min duration time and ph=9. As for the domestic water , the COD and oil content were 96.5%,96% at 0.52 mg/l ozone dose , at 55 min duration time and ph=9. The removal was lower for ultrasoniation .for carwash sample ,the COD and oil content were 94% and 74% at 45Co , at 55 min duration time and ph=9. As for the domestic water , the COD and oil content were 97% and 96 % at 55 min duration time and ph=9.
Finally, treatment of greywater with ozone has proven to be more efficient than ultrasound
Keywords: Grey water, Ozonation , Ultra sonication , COD, Oil, Domestic water, Car wash wate.

Experimental and numerical study on the effect of water cooling on PV panel conversion efficiency

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Abstract

The solar energy is available in a tremendous amounts around the world and the photovoltaic panels might be the solution global power problem. Put the use of PV panels is limited due to the low power conversion ratio. Along with the low conversion rate of the PV panels, its efficiency even drops with the rise of surface working temperature by 0.5% for each degree centigrade. This study investigate experimentally and numerically the effect of front face water cooling on the power production and efficiency. By developing a CFD and experimental module (cooled and conventional panel) for cooling the front face of the PV panel with 8, 6 and 4 LPM of water sprayed by 4 mm nozzle diameter. The results shows an efficiency increase up to 16.2% at 45 ℃ ambient temperature compared to a conventional panel works at the same conditions.

Keywords: PV efficiency enhancement, photovoltaic cooling, PV power conversion, solar energy, water film cooling, efficiency enhancement.

Purity Water Production Technique with Multi Power Resources

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Abstract: Secure drinkable water is decisive and fundamental in order to increase the welfare of current generations and beyond. A new design study represents, small, and portable system for production high-purified drinking water depends on several sources of electric power with nanotechnology principles by using nano-membranes. This system can purify the water from rivers, lakes and marshes wells, as well as any tap water, with the lowest level of water source, this system can work by depending on both AC, and DC power. Tests carried out on the filtered water samples showed that the well water hardness before filtering was 2783.2 mg/L and decreased to 431.2 mg/L, and the pH ratio increased slightly from 7.1-7.3 and this elevation was considered ineffective. TSS decreased from 15 to 11 mg / l, also TDS, Mg^{+2}, and Na^{+2} were all reduced as follows (4420-290), (414.03-21.46), (120-32) respectively, and for tap water TSS, Hardness, TDS, Mg^{+2}, Na^{+2}, and pH were all reduced as follows (6-4), (421-98), (430-127), (52.33- 16.04), (27-6), (7 -7.1) .These data where compared to the World Health Organization (WHO), which showed the efficiency of the system in obtaining water within the natural specifications necessary for human use.

Keywords: Nano-membranes; tap water; water treatment.

Photovoltaic panel type influence on the performance degradation due dust accumulation

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Abstract: This study investigates the effect of the type of solar cell technology used on its outcomes degradation when dust accumulates on it. Therefore, in this study, practical tests were performed on the physical properties of accumulated dust in the University of Technology Campus-Iraq for a period of three months. After that, a practical study examined the effect of the type of photovoltaic unit used on the decrease in current, voltage, and energy resulting from the accumulation of this dust with specific mass fractions. The comparison was made between the Amorphous, Monocrystalline, Polycrystalline, and Organic PV modules. The accumulation of dust causes significant decreases in current and has a limited effect on the voltages of all modules studied, as a result, the electric power generated decrease from all the studied photovoltaic modules due to the accumulation of dust. The accumulation of dust had the greatest effect on the Amorphous PV cell, followed by polycrystalline, monocrystalline and finally organic at 42%, 36.3%, 32.9% and 25.7%, respectively. The study demonstrated that the best option is to use monocrystalline cells for the university site. The study also concluded that the choice of any PV technology for a station at any site should be preceded by a study of the effect of dust in that location in order to favor any technique that must be applied.

Keywords: Dust accumulation; Amorphous, polycrystalline, monocrystalline; organic; PV module

Photovoltaic panel type influence on the performance degradation due dust accumulation

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Abstract: This study investigates the effect of the type of solar cell technology used on its outcomes degradation when dust accumulates on it. Therefore, in this study, practical tests were performed on the physical properties of accumulated dust in the University of Technology Campus-Iraq for a period of three months. After that, a practical study examined the effect of the type of photovoltaic unit used on the decrease in current, voltage, and energy resulting from the accumulation of this dust with specific mass fractions. The comparison was made between the Amorphous, Monocrystalline, Polycrystalline, and Organic PV modules. The accumulation of dust causes significant decreases in current and has a limited effect on the voltages of all modules studied, as a result, the electric power generated decrease from all the studied photovoltaic modules due to the accumulation of dust. The accumulation of dust had the greatest effect on the Amorphous PV cell, followed by polycrystalline, monocrystalline and finally organic at 42%, 36.3%, 32.9% and 25.7%, respectively. The study demonstrated that the best option is to use monocrystalline cells for the university site. The study also concluded that the choice of any PV technology for a station at any site should be preceded by a study of the effect of dust in that location in order to favor any technique that must be applied.
Keywords: Dust accumulation; Amorphous, polycrystalline, monocrystalline; organic; PV module

Enhancement Thermal Conductivity of PCM in Thermal Energy storage

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Abstract

An experimental investigation of different thermal energy storage materials in the solar collector is studied in this paper. Both, sensible energy storage materials and latent heat storage materials (PCMs) are used to enhance the storage system of thermal energy. The size of the tested solar collector 2 m*0.8m*0.15 collector length, width, height. Experimental results obtained from the proposed model indicate that the solar collector model, having a composite of paraffin wax with 5% aluminum powder can continuous operation, and the maximum air temperature difference (ΔT) between air enter to collector and exit from the collector if the ambient of 24.7 ºC, the effect on the efficiency of the collector

Keywords: *PCM, solar energy, enhance thermal storage, latent heat storage*

The Effect of Using LPG in a SI engine instead of using Gasoline fuel

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Abstract

The fossil fuels used in internal combustion engines are among the largest contributors to environmental degradation, and this fuel has a high economic cost, so the need to use alternative fuels with less environmental impact and less cost-effective cost. Therefore, researchers resorted to using different kinds of alternative fuels, including liquefied petroleum gas. This study provides a practical study comparing the use of LPG and gasoline in terms of performance and emissions from the four-stroke spark ignition, single cylinder, air cooled with a constant pressure ratio and variable-speed 1500–2500 rpm. A difference in volume efficiency, the brake thermal efficiency, fuel consumption and emissions of gases (HC, NO_x, CO_2, CO) has been measured that results have shown improved fuel consumption and thermal efficiency when using LPG fuel compared to pure gasoline. In contrast, the volume efficiency showed negative results when using LPG. the results also showed an improvement in LPG emissions in HC, NO_x, CO_2, CO with the use of LPG.

Keywords: Spark ignition engines, LPG, exhaust gas emissions, gasoline, Environment.

Nomenclature

bmep	brake mean effective pressure (Kpa)			
bsfc	brake specific fuel consumption (kg/kw. hr)		n	Number of strokes (rev/cycle)
FA	fuel – air ratio(–)		N	Engine speed (rpm)
LCV	Lower calorific value (kJ/kg)		Pb	power developed (kw)
ṁ	Mass flow rate (kg/hr)		V	Volume (m3)
act	Actual		T	Torque (N. m)
at	air-theoretical		η	Efficiency (%)
D	Displacement		Φ	Equivalence ratio
st	Stoichiometric			

OF MgO POWDER ON PHYSICAL AND MECHANICAL PROPERTIES OF POLYOLEFIN FIBER REINFORCED CONCRT

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Abstract

Expansive additives are widely used to compensate the drying shrinkage of cement-based materials to avoid cracking. However, the expansion of conventional expansive additive depends strongly on wet curing and is mainly generated at early age, and hence it may not work well in concretes without sufficient water supply or exhibit long-term shrinkage. MgO-based expansive additive, for which less water is needed for the formation of $Mg(OH)_2$ in comparison to other expansive additives .For the purpose this paper proposed a new kind of cement concrete overlay material comprised of polyolefin fiber and MgO powder. An experimental test procedure including density, compressive strength and flexural strength in this article was investigated. The results showed improvement of all the properties of the concrete mixes. Obvious compound effect of polyolefin fiber and MgO powder on concrete properties was noticed.

Keywords: MgO, Expansive additive, polyolefin fiber, density, compressive strength and flexural strength.

Fresnel lens solar concentrator to utilize the Extreme solar Intensity in solar still receivers

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Abstract.

This work presents an experimental study of solar distillation using a solar still receivers with a Fresnel lens concentrate. Two models of a cylindrical glass solar still (10 cm and 20 cm height) are used. The solar stills were placed in the focus of the lens to investigate the productivity of different models. The Fresnel lens concentrator is controlled to track the solar light and maintain the focal stationery. The results showed that the largest productivity for the solar still is (0.5 L/6hour) when the average solar radiation is 1280 W/m^2 and (0.5 L/6hour) when the average solar radiation is 1165 W/m^2 for (10cm and 20cm) solar still height respectively. The result showed that the productivity of the freshwater increased as the solar radiation increased. On the other hand, the productivity effect of the height of the solar still and other variables is less than effect amount of solar radiation. Also, the results showed that Fresnel lens concentrator can be efficiently used to provide fresh water during wintertime under Iraqi weather

Experimental study for laminar forced convection heat transfer enhancement from horizontal tube heated with constant heat flux, by using different types of porous media

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Abstract

Forced convective heat transfer for water flowing through a circular pipe oriented horizontally has been investigated experimentally. the pipe was heated at constant heat flux and also packed with two different types of particles (steel and mixture of steel & plastic) as a porous media.

The flow features are an internal, laminar, incompressible and steady flow for a wide range of Reynolds numbers (500,1000 and 1500) with variable heat flux (200, 400 and 600 W) for each case and three times for each number.

The experimental results comprehended temperature recording on different positions of test sections at steady state depending on the effect of the porous media type and Reynolds number employed (which indicate to the mass flux) in addition to the value of heat flux. The results of the study are represented in terms of temperature distribution to show temperature behaviors in the pipe, besides other diagrams uptake relation of the local and average Nusselt number with data aforementioned above. For each porous type, the results show an increase in local and average Nusselt number with increasing of the Reynold number for steel and mixture porous media respectively. It has obverse from this study that in a porous steel media the heat transfer will occur mainly by conduction, while in the other types of porous media that the heat transfer will occur mainly by forced convection.

Analytical Study on Effect of Bar Size on Pull-out force for Reinforcing Bar Embedded in Concrete Blocks

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Abstract:

The most commonly used test method for measuring the bond strength between reinforcing bars and concrete is the pull-out test of pulling a reinforcing bar out of a concrete block. During serviceability and durability design the bond of reinforcing bars is important in crack control. This paper presents numerical model for studying the size effect on pull-out force. This research considers three bar size diameter, which is 10, 12 and 16 mm bar diameter. The finite element ANSYS software was used for the numerical analysis. The specimens are analyzed until the specimens failure were occurred. The analytical results indicate that the pull-out force increase with increasing bar diameter. The pullout force for specimens S12 and S16 are increase (7% and 35%) compared with specimen S10 respectively.

Keywords: Concrete; bar size; pull-out; finite element; ANSYS.

Antireflection Coating influences on the Quantum Efficiency and the Reflectivity of a GaAs / GaAS Solar Cell within the Visible Spectrum

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Abstract

A theoretical investigation of the change in reflectance of silicon carbide (SiC) as a function of the particle size was the main focus of the current research. In addition, a single layer of anti-reflection coating of a quarter the wavelength is designed and doped in gallium arsenide (GaAs/GaAs) solar cell. The efficiency of the cell is investigated in the range of (400-700 nm) using the Brus model and the theory of characteristic matrix in the case of vertical and 45° ray to the plane of the incidence. The max efficiency for the designed cell (Air/Nano SiC/(GaAs/GaAs) was (% 96.81) of the wavelength of 550 nm in the case of vertical incidence. While in the case of an incident ray of 45° to the plane of the incidence, the efficiency was (%92.99) for the perpendicular polarisation (S) and (%97.23) in the case of horizontal polarization (P). the thickness of the coating was (Ps=2.2 nm).

Keywords: quantity efficiency, solar cell, anti-reflection coating and SiC

Improvements of some roundabout Intersections using capacity model Analysis

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Abstract. Several methods of analysis have been proposed to analyze the ability of vehicles to rotate and manoeuvre during roundabout intersections. Some models have been using formulas and calculations for extracting the results manually, while other models have been used to use the engineering software for the model. Given these differences, it may not be clear how best to use them in a particular situation. When comparing methods of capacity analysis, it will be useful to know how the various techniques are performed across a set of approaches Conflicting volumes. This paper reports on the ability of techniques to rotate multiple pathways based on maximum entry and exit traffic volumes using several methods of analysis. The research study the capacity model for some roundabout intersections in Hilla city, they are, (Al-Mohafada, Al-Saia and, Sahat Abn-Idreas). The capacity equations have been examined using some of the software programs, Highway Capacity HSC 2010, (Signalized Intersection Design and Research Aid) SIDRA, (macroscopic analysis and optimization software application). Synchro 10, to reach the best solutions to describe traffic capacity for each intersection within the study area. Data have been collected according to field survey include traffic volume for different types of vehicles and pedestrians, within antemeridian & post-meridiem (a.m&p.m) Peak Hour Volume (PHV), Number of lanes, lane width, median width, shoulder width and pedestrians crossing included too, using video technique method. Comparing the capacity for each approach and intersections using the above software programs on the bases of several variables: V/c, delay time, LOS and queue length. It was concluded that all intersections appear with the level of service LOS (E–F) according to (V/c)>1 and increase the delay time. Also, LOS improved from (F to C) when adding one lane for each approach for Al-Mohafada roundabout intersection according to output SIDRA software, as well as it was found that SIDRA software program gives significant results on a capacity model due to take into account the geometric characteristics of the intersections and pedestrian movements and crossing. Likewise, the Syncro program creates simulations of the roundabout with the traffic volumes entering the roundabout intersection, through which it identifies the conflicting points inside the circular intersection and shows the delay in each approach and also shows the queue for each approach.

Keywords: Roundabout, Capacity, HCS, Sidra software, Synchro.

Impact of Use Septic Tank Sludge for the application as Pozzolanic Material in high performance concrete

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Abstract

The disposal of septic tank sludge (SS) delivered from wastewater treatment plants is progressively getting to be a risk to the environment for includes Organic compounds which are scary to the public health and environment; over-volumes are every day created and deficiency of relevant landfill sites for wastes. This study aims to explore the impact of septic tank sludge as partial substitutions of ordinary Portland cement (PC) within the production of high-performance concrete (HPCs). The water/binder (W/B) ratio of all kinds of blends is fixed at 0.36 with total binder content of 492 kg/m^3. The concrete mixtures, in portion, are replaced with 0%, 5%, 10%, 15% and 20% of SS, individually. The impact of SS used to be analyzed through physical and chemical tests. The workability test of HPC was once decided to utilize the slump flow, Meanwhile compressive strength and tensile strength splitting experiments were conducted to investigate the impact of septic tank sludge on the hardened properties of HPC. The results demonstrated that SS may be a responsive pozzolanic material (PM) ; consequently which could be used as PM in concrete mixes. The concrete blend contains 5% cement substitution with SS illustrated to improve hardened properties of concrete at the all-age of specimens evaluated by comparing to concrete control . Sensibly, the substitution of 20 % septic tank sludge is desirable for creating high-performance concrete.

Keywords: Septic tank sludge; High-performance concrete; Workability; Compressive strength; Splitting tensile strength.

An Investigation to the Effects of Impact Strength on Laminated Notched Composites used in Prosthetic Sockets Manufacturing

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Abstract. The sockets used in prostheses manufacturing are normally made from materials of high strength/weight ratio for durability and comfort wearing purposes. The sockets may be subjected to impact loading and cause a fracture due to this loading if the material has a low toughness energy. Therefore, the current work is directed to investigate experimentally the determination of impact energy and the toughness of different types of fibers and resins to assess their effectiveness in sustaining the impact loading. Samples were prepared according to the ASTM standard using the fiberglass, Kevlar and carbon fibers with three types of resins araldite, polyester and Orthocryl lamination resin 80:20 with 2-3% hardener. All types of fibers are mat types and 12 layers were manufactured with thickness approximately 4 mm. The layers of the samples were arranged (4 perlon+4 kevlar+4 perlon), (4 perlon+4 glass+ 4 perlon), (4 perlon+4 carbon+4 perlon) and three mixed samples (3perlon+2 kevlar+2 perlon+2 carbon+3 perlon), (3 perlon+2 kevlar+2 perlon+2 carbon+3 perlon), and (3 perlon+2 kevlar+2 perlon+3 carbon+2 perlon). The sample with the lamination (4 perlon+4 kevlar+4 perlon) layers has shown a good ultimate stress= 124.7 MPa, and modulus of elasticity = 25.6 GPa with an acceptable of impact energy 13.7 Joule, toughness 147.9 KJ/m^2 and a fracture toughness of 65.77 MN/m$^{3/2}$ using the orhocrylic resin.

Keywords: Impact, Laminate, Strength, Prostheses, Sockets

Evaluating the effects of the flow direction on the performance of the rapid sand filter

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Abstract

The rapid sand downflow filter is widely used in water treatment plants. On the other hand, this filter has some drawbacks included the significant development of the head loss via the filter media because most of the rejected particles are removed by the upper layers. As well, the filter particles are redistributed during the backwash process causing the settling of fine particles on the upper part of the filter media, and this needs to increase the number of backwash processes. For these reasons, the cost of the produced water increases. The aim of the present study is to explore the possibility of using the upflow sand filter (UF-Filter) as a good alternative to the downflow sand filter (DF-Filter). To achieve the aims of the present study, a comparison was made between the performance of both filters through simultaneous experiments under different operating conditions. These conditions included changing of the filtering velocity from 5 m/h to 10 m/h and the initial water turbidity with a range of (10 – 200) NTU. The sand media with sizes of (0.6 - 1mm) and with 63 cm of depth was used. Experimental results show that the turbidity removal efficiency of the DF-Filter is of about 1.1 times that of the UF-Filter. On the other hand, the UF-Filter has higher turbidity removal efficiency than the DF-Filter by about 1.1 times when the initial turbidity of the influent water is greater than 150 NTU and the filtration velocity is equal to 10 m/hr. These differences in the removal efficiency between both filters can be considered as few values. The average filtration efficiency of the UF-Filter operated with the filtration velocity of 5 and 7.5 m/h is higher than that of the DF-Filter operated with the filtration velocity of 7.5 and 10 m/h, respectively under the same operating conditions. The filtration efficiency of both filters increases when the backwash was carried out before each experimental process instead of replacing the filter media. Also, the head loss of the DF-Filter is significantly increased due to redistribution of the sand media taking place during the backwash cycle, while the head loss of the UF-Filter is not affected. The head loss of the UF-filter at the end of each experimental run is less than that of the DF-Filter by about (18.18 % - 45.31 %) when the filter medium is replaced and this range is increased to about (53.31 % - 62.34 %) when the backwash is performed prior to the start of the experimental work. Thus, the decrease in head loss leads to an increase in the filter running time and decrease the number of backwash process.

Keywords: upflow filter, rapid sand filter, head loss, filtration rate, water turbidity treatment

CFD Simulation of the CO Emissions of Pollutants Contained in Flames H2-C3H8/Air

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Abstract— A mathematical simulation was developed using CFD in this study for the non-premixed combustion of two co-axial jets of a mixture consisted of propane, hydrogen, and air. The combustion chamber is represented in a three-dimensional cylindrical shape. The study aimed to evaluate the chemical and thermal properties of the mixture in the burner by adopting the following variables: temperature, axial velocity, and emitted CO. The study aims to identify and reduce carbon monoxide emissions to the environment as it is toxic pollutant. The addition of hydrogen to propane because it is a clean fuel that does not emit carbon monoxide as is the case with propane. In this study, the flame propagation velocity of hydrogen gas was compared to that of propane fuel.

Keywords— **Non-premixed Combustion Chamber; Turbulence; Hydrogen; Propane; CFD Simulation.**

Enhancement throughput and increase security of image transmitted over wireless network using (DNC)

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ABSTRACT: **This paper diagnose the problem of exchanging images among multiple nodes of wireless networks through using DNC (digital network coding). Our algorithm is introduced new technique in simple design to transmitting image with more security through relay nodes. We used DNC technique for enhancing the throughput, efficiency and scalability, as well as resilience to attacks and eavesdropping of the wireless network. The relay node of the proposed algorithm network receiving and combining the two images of two transceiver nodes that need for exchanging the data using XOR MATLAB function and retransmit it over AWGN channel with different values. We using (512*512) RGB-JPEG images. The modulation scheme that used in the proposing algorithm 64-QAM, the receivers applying Median filter to improve the received data. Many standers are used to testing the algorithm such as PSNR, MSE, BER, the entropy and SSIM. The algorithm was simulated by MATLAB 2015a.**

KEY WORDS: **Digital network coding, RGB image, throughput, security**

Determination of Pedestrian Level of Service on Sidewalks in Samawah City

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Abstract This study focuses on assessing pedestrian walking characteristics on sidewalks. The fundamental relationships of flow – speed – density were investigated and analysed in Samawah city. The video recording method was implemented to observe pedestrian characteristics such as flow and speed at four survey sites. These data were used to develop mathematical models that figure the aforementioned relationships. To obtain the best fitting of each relationship, the coefficient of determination R^2 was calculated. The results of this study were compared with the other research outputs. Finally, the level of service boundaries for pedestrians' movements on sidewalks were defined.

Groundwater Impact of Samarra city agriculture areas

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Abstract

The high population density and land wide variation use led to environmental problems in Samarra city, for this purpose the environmental assessment became an urgent need for underground water rising on some soils properties at study area. Experiment carried out to study effect of rising underground on some properties of soil in Samarra city. Five locations of outskirts in Samarra city , the samples were collected and analysed by standard methods of FAO (2000) and Atomic Absorption Spectrometer (AAS) according the Standard methods (APHA, 2005).The result showed higher percentage in location 5 with value reached (79 and 84 %) and (7.9 and 8.2) on depth 15 and 30cm of humidity and pH respectively. While lower values were (17 and 14) and (6.8 and 7) of humidity and pH with location number one(1) sequentially. Analysis results of EC and HCO3 in recorded high values with location 4 were (4.2 and 4.2 dS/m) and (22 and 20 ml/L) at 15 and 30cm depth, while location No.1 less values given (5 and 3.9 dS/m) and (21 and 16ml/L) for 15, 30 cm respectively.

Key word: Underground water, Agricultural land, Soil properties, Samarra city.

Strengthening of RC Circular Short Columns with Fibrous Jacket

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Abstract.

This research presented a wide study about the structural behavior and strength of RC circular short columns when strengthened with concrete jackets strengthened with steel fiber. A total of 17 circular columns were designed, fabricated, and tested experimentally under monotonic load. An experimental investigation was carried out to assess the efficiency of the fibrous jacket in the retrofitting of RC column. The parametric study was conducted which included using four columns as control specimens with different cross-section dimensions. The remaining 13 column specimens included strengthening the column by different parameters such as steel fibers ratio and type, jacket thickness, bond by epoxy, and full and limited jacket height. The ultimate stress and strain, crack pattern, failure modes, ductility, and toughness capacity of the specimens were studied. The experimental outcomes exhibited that the fibrous jacket enhanced the ultimate strength capacity, ductility, and changed the failure mode of columns. The increase in the steel fibers ratio (1%, 1.5%, and 2%) enhanced the ultimate load capacity by (194%, 71%, and 126%) respectively. Strengthened columns by FRC jacket with thicknesses (25, 35, and 45) showed enhancement in the stress carrying capacity by (126%, 242%, and 171%) respectively. Using epoxy appeared a different behavior in comparison with square columns. The use of epoxy showed lower stress capacity by (21% and 24%) for (1% and 2%) hooked steel fibers ratio respectively. Use of hoop jacket case enhanced the ultimate stress capacity better than composite case. straight fibers were better than hooked ones in the improvement of ductility and energy absorption.

Keywords: Circular columns, fibrous jacket, jacket thickness, Ductility, steel fibres, energy absorption.

Seepage and Slope Stability Analysis of Haditha Dam using Geo-Studio Software

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Abstract. The current study is designed to model seepage and slope stability analysis of Haditha dam (Iraq) using finite element method by GEOSTUDIO 2012 software. GEOSTUDIO software is capable to carry out analysis such as, stress-strain, seepage, slope stability, dynamic analysis. SEEP/W and SLOPE/W are sub programs of GEOSTUDIO which can simulate the movement and pore-water pressure distribution within permeable materials like soil and rock. In the present study Haditha dam, which is an earth dam constructed on the Euphrates River in the middle west of Iraq 7 km upstream from Haditha city in Al Anbar governorate with a total length of the barrier 9064 m was chosen as a case study to simulate the seepage and slope stability analysis. The input data given to the software are the geometry of the dam and its material properties. The flow net is generated by SEEP/W software showing phreatic line, equipotential line, and stream line. Also, the seepage influx is computed by the software. The dam at its actual design was investigated by inspected the water in the reservoir to be at maximum, minimum and normal water level. It was concluded that the dolomite core and the presence of asphaltic-concrete diaphragm and the grout curtain have an important effect on decreasing the seepage quantity through the dam body and the factor of safety values of upstream and downstream slopes stability satisfy the minimum limits for all levels of water.

The role of liberation and correlation in the interpretation of architectural product/Islamic buildings as a model

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Abstract: That access to a mechanical can clarify the integrative picture of the phenomenon of architecture, using syndical considerations, variable, expandable, and moving, with the dominance of some and the weakness of others, but the product is not without its existence, as it controls the positive transmission from thought to product. By neglecting them, it means neglecting to consider, truncate, and neglect a part that affects the architectural product according to the transitions and transformations over time. There is no clear mechanism on this subject, and for this reason, the research presents the research problem" **Knowledge deficiency about the role of the correlation and liberation relationship in achieving communication in the products of architecture".** The research relied on a set of contemporary Islamic models for verifying the vocabulary of the theoretical framework. The research concluded that the correlation between the **considerations of the liberation mechanism** is one that achieves products, that possess continuity and dialogue with the other, and gives continuity of production over time through the following dimensions: **Temporal and spatial relationships**, achieve belongingness and communication between the past and the present, to grant identity to production**. Technology** is adapting production to the present. **Events** make the product alive and continuous over time**. The role of the human** being as a designer according to his knowledge background and its interaction with the values, beliefs, customs, and traditions that must be preserved.

Keywords: correlation (dimensions and levels), liberation, consideration of the liberation mechanism, architecture phenomenon, technology, human, event, Architectural production

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Palm dates as a source for isolation of *Aspergillus niger* to produce citric acid by submerged fermentation; kinetics study

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Abstract. The study discussed here deals with the isolation of Aspergillus niger from palm dates, the formal and the most famous fruit in Iraq, to test and qualify this fungus isolate for its ability to produce citric acid. Submerged fermentation technique was used in the fermentation process. A.niger isolated from "Zahdi" Palme dates was used in the study of the fermentation kinetics to get the production efficiency of citric acid. Kinetics of CA production via fermentation by A. niger S11 was evaluated within 432 h fermentation time and under submerged conditions of 11% (w/v) sucrose, 5% (v/v) inoculum size, pH 4, 30 °C and 150 rpm. The maximum citric acid produced was (37.116 g/l). Kinetic criterions (product, exhaustion and growth rates "Cp/t, Cs/t, Cx/t", yield coefficients "Yp/s, Yp/x, Yx/s", and specific fermentation rate constants "q_p, q_s") were studied and discussed to reach to a logical explanation of fermentation process.

Keywords: Citric acid, Aspergillus Niger, dates, submerged fermentation, fermentation kinetics.

Recyclable Wastes as Internal Curing Materials to Improve High-Performance Concrete's Sustainability, and Durability: An Overview

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Abstract:
This study discusses the researchers' experiences with regard to the use of sustainable materials (waste materials and recycling materials) as internal curing materials during the development process for high-performance concrete (HPC). Generally, the use of waste materials as internal curing materials to enhance interior curing reduces the self-desiccation that occurs in cement paste concrete and can thus reduce the risks of the cracks that may develop as a result of modern concrete hardening. This research also examines high-performance concrete behaviours, including characteristics such as density, compressive strength, splitting tensile strength, and flexural strength to examine internal curing efficiency. This appears to be more effective with age progression in terms of compressive strength and splitting tensile strength. The results of the research show that the use of waste materials as internal curing agents not only enhances the properties of concrete but also offers a renewable method for reducing the amount of waste globally.

Keywords: Sustainability; Internal Curing (IC); High-Performance Concrete (HPC); Compressive Strength; Split Tensile Strength; Flexural Strength.

Investigation of Natural Composite Materials Pipe Under Thermal Load

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Abstract:

Experimental and analytical solution using classical shell theory solve by Matlab software was used to found thermal stresses under thermal load for natural composite materials pipe. Two types of natural fibers (eggshell and ash of fire wood) were used as reinforcements with polyester-resin. The experimental work including the manufacturing of the test samples (eggshell/polyester and ash of fire wood /polyester) by resin casting method with 40% volume fraction. Tensile and thermo-mechanical test were performing to find the mechanical properties of the specimens The results showed that eggshell natural composite had the highest strain ,stress, and good mechanical properties compared with ash of fire wood natural composite but regarding temperature withstand the ash of fire wood specimens had the highest compared with egg shell specimens.

Study of the effect adding the polypropylene fibers and chemical additives on the behavior of Ultra-High-Performance Concrete

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ABSTRACT

Ultra-High-Performance Fiber-reinforced concrete (UHPFRC)is an improved best of types of concrete containing fibers randomly distributed inside it, and high resistance give. The mechanical properties of concrete have been developed namely, compressive, flexural, and tensile strength by adding the fibers, and some chemical additives (superplasticizers) to reduce the percentage of water, and to ensure suitable workability. Also, the fiber makes the concrete very durable, tougher, and lower permeability. This paper aims to enhance the concrete mechanical properties by adding polypropylene fibers in combination with superplasticizers as a partial cement replacement. Test results give a good improvement by using both polypropylene fibers and superplasticizers. The split tensile strength and the flexural strength are increased significantly from 14.1 to 18.3 MPa, and from 14.28 to 20.85 MPa, respectively. While concrete strength of compression increased from 124.05 MPa to 145.87 MPa due to the inclusion of polypropylene fibers and superplasticizers. This will be seen as the experimental results showed a big improvement within the residual mechanical properties of the UHPFRC which contain the fibers compared to concrete mixes without fibers.

Keywords: Polypropylene Fibers; chemical additives; Ultra High Performance Concrete

Sustainable Development of Highly Flowable Cementitious Grouts for Semi-flexible Pavement Mixture

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Abstract

Grout is a substance with a cement which is characterized by a high strength and it is a high workability, so it can be injected in places of small cracks or places of water leakage. Generally, it is used to repair cracks or defects of concrete, also it can be used to fill the voids under the metal bases or digging anchors. Moreover, grout is used efficiently in the process of production the semi-flexible pavement mixtures. The purpose of this study is to design a sustainable grout using waste and by-products materials, to end as flowable grout for semi-flexible pavement mixtures. The mixture of the grout was prepared using Ordinary Portland Cement (OPC), silica fume (SF), paper sludge ash (PSA), superplasticizer (SP), and water. Different proportions of mentioned materials were used to characterizing the developed grout through flowability, compressive strength, and flexural strength tests. Results showed that the flow time increases with increase in the surface area of cementitious materials. Also, the compression strength of the grouts comprised OPC+PSA, revels that there is an optimal dosage: i.e., 15% PSA. Whereas SF generally leads to increase the compression strength. On other side, flexural strength test confirmed the upgrading of developed grouts. As a conclusion, a sustainable grout can be produced with acceptable characteristics when grout constitutes are optimized.

Determination of Heat Transfer Coefficients in Air-Solid Fluidized Bed

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Abstract

The heat transfer of gas-solid fluidized bed has been investigated using pre-heating system. A Perspex column of 7cm inner diameter and 1.5 m height is used as a fluidizing column filling with three different sizes of sand with a height of 21 cm as packing.

The experimental work is carried out under superficial air velocities ranged of (0.029- 0.365) m/s. The effect of opening area air distributors, particle diameter of sand packing, and different heat fluxes as powers have been investigated. The results show that the minimum fluidizing velocity increases with increasing the particle diameter and opening area of distributor. The gas-particle heat transfer coefficient is found to be increased by increasing superficial velocity, heat flux and opening area of distributor and decreased by particle diameter.

A mathematical correlation of dimensionless groups based on experimental data has been suggested. A comparison between results of present correlation and the speculations of previous ones has been made.

Keywords: fluidized bed, gas-solid system, heat transfer coefficient, Minimum Fluidization Velocity.

Design of dual band elliptical microstrip antenna for satellite communication

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Abstract. A microstrip antenna with an elliptical patch is designed. The antenna has dimensions of $(19x23x1.6)mm^3$, it is mounted on a substrate with **4.3** relative dielectric constant (ε_r) and **0.025** loss tangent (tan δ) and it can be used for satellite communication. The antenna covers a bandwidth of (9.89-10.49) GHz and (17.4-19.24) GHz, the gain in the mentioned bands is (1.5-3.3) dBi and (4.6-2.8) dBi respectively with a voltage standing wave (VSWR) less than 2. The antenna is adjusted by adding a slot in the ground and steps in the feed line in order to get a better group delay characteristics. The simulation results are obtained using CST software.

Keywords. *Microstrip elliptical antenna, UWB, satellite communication, dual-band, microstrip line feed.*

Investigation Experimentally the Effect of Thermal Stresses on the Straight and Curved Natural Composite Material Pipes

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Abstract

This paper study experimentally the effect of changing the angle of curvature pipe made from natural composite materials (eggshell powder with polyester) under thermal load. This work involves the design and fabricate of straight and curved pipe samples with difference angle of curvatures (34° and 48°) at 50 % weight fraction. Three composite pipes were tested (straight pipe, curved pipe with angle 34°, and curved pipe with angle 48°). Tensile and thermo-mechanical test were performing to find the mechanical properties of the specimens. Experimental work included design and manufacturing test rig to simulate thermal stress .The experimental results revealed that a maximum hoop strain and longitudinal strain increased with increasing the temperature for all test pipes. The longitudinal stresses at crown and intrados positions were more than the longitudinal stress at extrados position by 258 % and 199 % respectively and the von mises stresses at crown and intrados positions were more than the von mises stress at extrados position by 180 % and 165 % respectively. In the curved pipe with angle 48°, the hoop strains at intrados and crown positions were more than the hoop strain at extrados position by 78 % and 37 % respectively.

Variations Size Investigation in Vegetation and Surface Water Body for Central Part of Iraq using Satellite Imagery Bands

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Abstract

The variations in vegetation and surface water body sizes play a huge role in the central region of Iraq, which includes three lakes: Al-Tharthar, Al Habbaniyah and Al-Razzaza Lakes. Several temporal satellite images Landsat TM (1990, 2000 and 2007), Normalized Difference Vegetation Index (NDVI) and supervised classification technique were utilized. The current research herein aims to investigate, evaluate and map the changes of vegetation and surface water bodies throughout the period of time for the study area, to know and explain the influential factors for these environmental changes. The final results would help the authorities for assessment and environmental management. The results showed a significant gap in the environmental variations in the study area from 1990 to 2000 and from 2000 to 2007. The period from 1990 to 2000 showed the highest vegetation cover difference. The year 2007 showed the highest vegetation re-growth. The total water surface area of the three lakes decreased for the years 1990, 2000 and 2007. The surface water area percentages of all three lakes in August of 1990, 2000 and 2007 were about 10.6%, 2.5% and 7.6% respectively. The highest water surface area was in 1990.

Keywords: *NDVI*; supervised classification; surface water body; GIS; satellite imagery

Synthesis of magnetic zincoxysulfide core/shell nanocomposites (Ni@ZnO$_{0.6}$S$_{0.4}$) for COD photocatalytic degradation in oil refinery wastewater

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Abstract

In this work, magnetic Ni@ZnO$_{0.6}$S$_{0.4}$, Ni@ZnS and Ni@ZnO a core/shell nanocomposites were prepared through the facile two-step precipitation process as photocatalysts for COD degradation in refinery wastewater. Multiple analysis methods were used to describe the morphology, phase structure and magnetic characteristics of the synthesized photocatalysts such as field emission scanning electron microscope (FESEM), atomic force microscopy (AFM), X-ray diffraction (XRD), and vibrating sample magnetometer (VSM). The COD degradation efficiency from ZnO$_{0.6}$S$_{0.4}$ nanocatalyst has been investigated as a function of photocatalyst dose, pH and an irradiation time. The Ni@ZnO$_{0.6}$S$_{0.4}$ photocatalyst could efficiently degrade the COD content (89%) under visible light irradiation (LED lamp) within 3 hr. The as-acquired Ni@ZnO$_{0.6}$S$_{0.4}$ having magnetic properties was readily collected via a simple magnet. More significantly, nearly no lowering of photocatalytic degradation was noticed even after five sequential reaction cycles suggestive of Ni@ZnO$_{0.6}$S$_{0.4}$ photocatalyst show perfect stability to reuse.

Key words: magnetic zinc oxysulfide; core/shell; photocatalyst; visible light; refinery wastewater; COD degradation.

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IoT-Based Monitoring and Management Power Sub-Station of the University of Mosul

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Abstract: Managing power plants usually involves monitoring many data and parameters that occur within minutes, hours, or days. Nowadays, a mount of digital data can be exchanged, analyzed and easily accessed through modern technology called the Internet of Things (IoT). In this paper, an IoT (using Wi-Fi development kit called Photon) is used to remote control and monitor the performance of the University of Mosul power plant. This includes monitoring the Power Factor, supplied voltage and total load current of each sub-station within the university area. The system also applies a safety feature to completely close the power plant in the event of a serious condition such as a fire. ThingSpeak is used in this paper as an IoT analytics platform service which lets the programmers collect, visualize and analyze incoming data streams to the cloud. The collected data is sent to the ThingSpeak by the Photon devices, create instant visualization of live data related to the monitored station, and send the required alerts. The engineers responsible for the station can monitor the progress of the work of the station through any connected device - a computer or a smartphone - from anywhere in the world and even reprogram the system during operation, if necessary.

Keywords: IoT, Energy Monitoring, Photon, ThingSpeak**.**

Self-Powered 6LoWPAN Sensor Node for Green IoT Edge Devices

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Abstract— In this paper, a simulation model and practical testbed for green Internet of Things (IoT) edge devices are proposed based on solar harvester with constant voltage-maximum power point tracking (CV-MPPT) technique. Billions of connected edge devices represent the essential part of the IoT through the IP-enabled sensor networks based on IPv6 over Low power Wireless Personal Area Network (6LoWPAN). In traditional IoT edge devices, the stored energy in the non-rechargeable battery determines the node lifetime while it is being depleted with time. Therefore, purchasing billions of such batteries is costly and must be disposed of efficiently. This paper is aimed at simulating and implementing a new class of green IoT edge devices that can report data wirelessly and powered perpetually using clean energy. The developed edge device utilizes solar energy harvesting mechanism through photovoltaic (PV) module, this approach will avoid periodical battery replacement and hence, the energy supplied to the sensor mode is not limited anymore. The implemented testbed is based on open-source hardware and software platforms while the simulation environment is based on MATLAB/ SIMULINK 2019a. The effects of temperature and solar irradiance on the performance of the developed approach are examined in order to confirm the leverage of the proposed methodology scheme. The lifetime of the developed green IoT device is predicted based on the device's activities, current consumption, and energy storage capacity. The obtained results showed that the battery lifetime is extended by 38-49% when the edge device runs on an independent power source.

Keywords—6LoWPAN, Energy Harvesting, Green Energy, IoT, Self-Powered Node, Solar Energy, WSN.

COMPARISON BETWEEN WEIGHT AND VOLUME PERCENTAGES FOR CEMENT MORTAR

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Abstract:

The concrete in a simple case is a mixing of cement mortar and aggregates. Cement mortar consist of mixing cement and water which is cover the surface of aggregates. Through hydration of cement, the mortar becomes hardened and forming such like rock mass which is called concrete. The key of gaining hardened and strong concrete produced in a well mixing percentages and by mixing method which it is either weight or volume mixing. Concrete which has no equivalent cement mortar enough to fill spaces between aggregate particles lead to difficult molding process and produced concrete with weak strength. There are two ways of measuring materials in cement mortar: by weight and by volume percent, the first one is more accurate than the other specifically in determination compressive strength of cement mortar cubes, because it is having more cement content as compared with the second one. In this research, three percent (1:1, 1:2, 1:3) is taking with constant water to cement ratio of (0.35), the dimensions of cube are (7*7*7) cm to calculate compressive strength for (3, 7, 14, 28) days. The weight percentages have compressive strength more than volume percentages by changing factor of (1.2).

Keywords: cement mortar, weight measurer, volume measurer

Combined Vacuum Sensor For Measuring the Density and Composition of the Ionosphere

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Abstract- A design of an electron-ion trap for a sensor of the density and composition of the upper atmosphere (ionosphere), intended for placement on nanosatellites, is proposed. It allows you to capture charged particles of any energy and direction of their speed, dividing them by the sign of charge and energy. This ensures the correct operation of the vacuum gauge Converter of this sensor and the ability to register the density of charged particle flows, dividing them by sign and energy. The calculation of the maximum energy captured by the upper system of the trap electrodes and the estimation of the values of the trap currents in the required range of heights was performed. High-energy particles that pass through the upper system of electrodes are captured by the lower system of electrodes.

Keywords: ionosphere, density, composition, experimental studies, inverse-magnetron converter, modeling.

DESIGN AND IMPLEMENTATION NOVEL FILTER TO DE-NOISING THE ELECTROCARDIOGRAM SIGNALS

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ABSTRACT

One of the most important vital signs that contain a large amount of information about the human health status is the electrocardiogram (ECG) signals. Numerous researches have been done to improve the sensitized signal from the heart in order to reduce the possibility of errors in diagnosing symptoms, which are determined by drawing an ECG signal Electro. The purpose of this research is to present novel system that improves and reduces the noise accompanying the ECG signal by applying a set of filters individually and collectively. The results of presented filters show robust performance against different noise types.

Keywords: Electrocardiogram (ECG) signals, Baseline Wander, Arifacts, and Finite Impulse Response (FIR) filter.

Evaluation of the Groundwater Quality for Irrigation: Case Study of Hilla district, Babylon Province, Iraq

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Abstract. A crisis of water scarcity in the world encouraged researchers, especially in the arid areas to know the nature and quality of all its sources regardless of surface water. The groundwater evaluation for irrigation was suggested by using the model of Water Quality Index for Irrigation (WQIIR) in the ArcMap/GIS Software. This model was applied to 48 wells distributed throughout the Hilla district, Babylon, Iraq. The samples of EC, Ca^{+2}, Mg^{+2}, Cl^{-1}, Na^{+1}, $HCO3^{-1}$, and SAR for groundwater were collected from these wells during wet and dry seasons in 2016. The generated maps in GIS for the WQIIR model in both seasons were divided into categories based on restriction`s groundwater use for irrigation. These categories consisted of Severe Restriction (SR), High Restriction (HR), Moderate Restriction (MR), Low Restriction, and No Restriction. The areas values and their classification of restriction`s groundwater use for irrigation related to the five categories that resulted within the generated maps in GIS using the WQIIR model in the wet season (in km^2) were: 42.79 (SR), 407.05 (HR), 377.77 (MR), 32.39 (LR) and 0.23 (NR) respectively and for the dry season were as follows: 42.79 (SR), 407.05 (HR), 377.77 (MR), 32.39 (LR) and 0.23 (NR) respectively. The areas and the classification categories of restriction groundwater for irrigation calculated based on the values resulted from the WQIIR model have shown variation in the dry and wet seasons.

Investigate and Compare Software-Defined Network Controllers for UAV Networks Management

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Abstract. Unmanned aerial vehicles that abbreviates (UAVs) are flying platforms, known as drones, which have features such as mobility, adaptive altitude and flexibility. UAVs admit numerous applications that can be used as aerial base stations to enhance coverage, capacity, and energy efficiency of wireless networks. On the other hand, UAVs can operate as flying mobile terminals within a cellular network. Such cellular-connected UAVs can enable several applications ranging from real-time video streaming to item delivery. A Software Defined Network (SDN) Controller is the application that acts as a strategic control point in a software-defined network. It is the "brain" of the network. Controller manages flow control to the routers/switches 'under' (via southbound APIs), the business logic and applications 'above' (via northbound APIs) to deploy intelligent networks. Wireless networking with software defined (SDWN) is the use of SDN conceptions in wireless networks by using a controller in the control plane. SDWN facilitates the creation of new adaptive mechanisms according to various applications and user requirements, such as mobility, handover, security and quality of service (QoS). In this paper, simulation work has been conducted to compare and investigate four SDN controllers (Pox, Ryu, Floodlight and OpenDaylight) in order to see which one is suitable to be used. Mininet-Wifi has been selected as the simulation tool to do the experiments and Python script for programming. The results obtained reveals that Ryu controller is the best selection in terms of latency and packet loss.

Keywords: Mininet-Wifi emulator, SDN UAV Networks, SDN Controllers, SDWMN