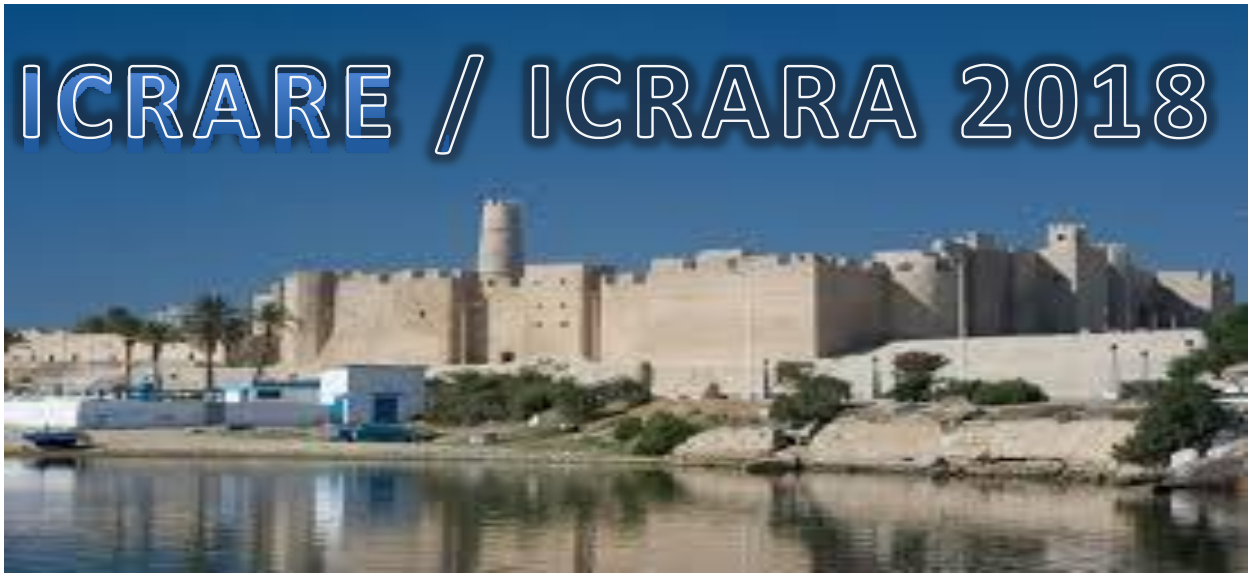
C.E.S International Joint Conferences

ICRARE 2018
November 03-04,2018

ICRARA
Monastir -Tunisia
03-04 November 2018

International Conference on Recent Advances in Renewable Energie

International Conference on Recent Advances in Robotics and Automatio



Hotel Monastir Centre
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The carthage for engineering and science (a science organization) and **C.E.S Group** (a CONSORTIUM OF ENGINEERING AND SCIENCE) with the collaboration of GARI Research Symposium of the GLOBAL ACADEMIC RESEARCH INSTITUTE organizes "The International Conference on Recent Advances in Renewable Energies (ICRARE'18)" in November 03-04,2018. This conference aims at attracting the interest of specialists, academicians and researchers as well as manufacturers,practitioners and customers from the international community working in research areas and investments related tovarious applications of renewable energies. TheICRARE'18 allows the scientific community working in theses areas to exchange, share and discuss advances and developments in renewable energy research and applications. The conference will be organized in specialized symposiums focusing in various aspects of renewable energy applications chaired by specialists and focusing in the following themes.

- Green Renewable Energy Systems (GRES) as Solar Geothermal & Wave Energies, Wind Power, Hydropower
- Renewable Energy Research and Applications for Industries
- Hybrid Green Renewable Energy Systems
- Safety and Security and Control Techniques in Renewable Energy Systems
- Renewable Energy Systems in Smart Cities
- Challenges in GRES and Future Strategies and Directions for Policy Makers
- Renewable Energy in Strategic Sectors : Solar and Geo-thermal Water Desalination , Photovoltaic Application and Electricity Production (SMART GRIDS), Solar Heating and Air Conditioning
- New Materials and Materials Characterization in RE systems

ICRARA 2018 CONFERENCE DESCRIPTION

The International Conference on Recent Advances in Robotics and Automation

Nov 3-4, 2018 – Monastir, Tunisia

The CARTHAGE FOR ENGINEERING AND SCIENCE (a science organization) and **C.E.S Group** (a **CONSORTIUM OF ENGINEERING AND SCIENCE**) with the collaboration of **GARI Research Symposium of the GLOBAL ACADEMIC RESEARCH INSTITUTE** organizes "The International Conference on Recent Advances in Robotics and Automation **(ICRARA'18)**" in the **November 03-04, 2018**. This conference aims at attracting the interest of attendees to exchange, share and discuss advances and developments in Robotics Research and Automation Applications. **ICRARA** is a platform for Research scientists, investors, industrial and government representatives to present the latest innovations, novel results and the-state-of-the-art ideas. The conference will be organized in specialized symposiums focusing in various aspects of Robotics and Automation applications chaired by specialists and focusing in several themes.

The Themes Covered by the ICRARA Conference 2018 are but not limited to:

Cinématique, Dynamique et Contrôle
Manipulation adroite, Locomotion, Contrôle non-linéaire, Servomoteur visuel.

Mécanismes et Conception

Planification et algorithmes.

Manipulation

Interaction Humain-Robot et Systèmes Centrés Humains

Robotique de terrain.

Méthodes formelles

Systèmes distribués

Robotique médicale

Robotique Biologique

Perception du robot

Systèmes mobiles et mobilité

Apprentissage et Estimation pour les Systèmes Robotiques

CONFERENCE PAPER

ABSTRACTS

Manufacture of polyurethane foam with a certain density

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Abstract— For the manufacture of polyurethane foam of a certain density, we seek to control as much as possible the formation of a microstructure so that the final product has the desired properties for non-lethal projectiles. The latter must be able to incapacitate a target without causing a permanent injury or a fatal outcome. This work aims at the elaboration and the mechanical characterization of different polyurethane foams elaborated by the optimal formulation. Mechanical characterization is about quasi-static compression testing. In addition, microscopic analysis was performed to confirm the open cell structure of the elaborate foam.

Keywords— Polyurethane foam; Density; Non-lethal projectiles; Compression; Microscopic analysis

Aptitude of using Algerian slag for the elaboration of glass-ceramic materials for heat storage

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Résumé — Using wastes as starting raw material is a common method to reduce the production costs of many materials. In this experimental investigation, the preparation of glass-ceramic was by using some different types of slag.

The powdered were pressed and heated with the heating rate of 10·C /min. up to the reaction temperature of (1100·C, 1150·C, 1200·C and 1350·C) and soaked for the different time (1h,2h, and 3 hours). The specimens obtained were subjected to DTA, XRD analysis to quantify crystalline phases.

The results show that the main obtained phases glass- ceramic is “Gehlenite" and " wollastonite" specially, for the sample heated at 1150·C for 03 hours

Keywords: *glass-ceramic, slag, materials*

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Energy prediction system of smart home

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Abstract— Actually, the energy consumption prediction in a smart home is an important subject of research. In this paper, we will propose a model that based on genetic algorithm that can help inhabitants and decision-makers to make the best decision, in term of energy consumption. We will implement our system, which can help the inhabitants optimize their energy consumptions using many technics as NodeMCU, cloud computing, and genetic algorithm.

Keywords— smart home; NodeMCA; Cloud computing; genetic algorithm.

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Design urban composition in the context of improving indoor thermal comfort

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Summary:

Today the construction of cities. Is no longer a simple urban design issue. that respects the ordinary urban planning laws given the emergence of sustainable development and their requirements have given rise to new reflections to rethink the sustainable urban composition of tomorrow that has become an essential tool to achieve certain urban comfort, On the other side, we can't ignore the impact of these compositions on interior comfort, which has remained an indicator for a satisfied urban composition; it's obvious that the nature of such an urban composition affects the quality of indoor thermal comfort; through the various exchanges like the transfer of heat between the buildings; exterior landscaping; the streets. People often report discomfort inside the building, which has led to significant energy consumption during the year in relation to heating and cooling. See even a requirement to approach the design of Mediterranean cities. With a new approach taking into account the dimension of interactive influence between the outdoor space on the inside space. This analytical approach encompasses (the layout of buildings, the layout of streets, nature of outdoor developments). For this situation we try to make an identification of the parameters related to the urban composition; which must be taken into consideration during the period of urban design. To achieve some level of indoor thermal comfort. Then establish an indicator grid that allows us to arrive at an adaptable urban composition in a specific context. Enabling contribution to interdisciplinary scientific effort in urban planning; to achieve certain sustainable urban development.

Key words: urban design - urban composition - indoor thermal comfort - heat transfer - exterior landscaping.

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Etude comparative des résistances des bétons déterminées par essais destructifs et non destructifs

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***Résumé*—** Dans cette étude nous avons cherché à mesurer la résistance du béton par le scléromètre (essais non destructifs) et par écrasement (essais destructifs) à différents âges (28 jours et 3ans), et pour suivre l'évolution du béton dans le temps nous avons calculé sa vitesse du son qui permet d'évaluer sa résistance de manière non destructive. Le béton de laitier est un nouveau matériau qui utilise les déchets de haut fourneau comme agrégats, L'utilisation d'un tel déchet industriel comme matériau de substitution contribuera à sauvegarder une part importante des ressources naturelles et protéger l'environnement. Trois mélanges de bétons ont été étudies, ce sont : (1) béton ordinaire sans substitutions des granulats, (2) 100% du gravier et du sable naturel ont été substitué par le sable et le gravier de laitier cristallisé, (3) 100% du gravier et du sable naturel ont été substitué par le sable de laitier granulé et le gravier de laitier cristallisé. La caractérisation de ces bétons a été faite a partir de leurs propriétés mécaniques : la résistance à la compression, et la résistance à la traction ainsi que sur leur durabilité: capillarité, et absorption d'eau massique. Les résultats expérimentaux ont montré que la différence entre les deux résistances obtenue par l'essai destructif et non destructifs sur les bétons, à diminuer à l'âge de 3 ans, et une augmentation linéaire du rapport de charge (3ans/28jours) pour le béton tout laitier contient 100% du sable granulé et laitier cristallisé.

Mot clés—béton de laitier ; laitier cristallisé ; performances ; caractéristique du matériau

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Rectifier Design for RF Energy Harvesting Enabled Quadrature Phase Shift Frequency Selective receiver

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***Abstract*—**In this paper a radio frequency (RF) energy harvesting circuit using a single diode has been designed for a quadrature phase shift frequency selective (QPS-FS) receiver architecture. The QPS-FS receiver is a frequency selective receiver in which the desired band RF signal is frequency down-converted as baseband signal while the out-of-band interferer and blocker signals are reflected by the receiver. The out-of-band interferer and blocker signals will be processed by an RF energy harvester (EH) circuit so that the out-of-band RF energy is converted into direct current (dc) energy that will be further used by the power management block of the receiver to increase the battery life of the overall receiver system.

Keywords*—*diode rectifier; energy harvesting; frequency selective receiver

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The Effect of Base Fluid on Nanofluids Convective Heat Transfer in Horizontal Pipes

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Abstract— The purpose of this numerical study is the investigation and the comparison of three base fluids impact on laminar convective heat transfer of alumina based nanofluids. The geometry used is a horizontal smooth pipe submitted to a constant and uniform heat flux. Three-dimensional governing equations have been solved using finite volume method. The obtained results show a significant increase in heat transfer ratio comparing to pure water at several volume fractions. Meanwhile, ethylene-glycol based nanofluid offers a superior enhancement. However, axial velocity profiles remain constant.

Keywords—Convective heat transfer; nanofluid; horizontal pipe; base fluid

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Influence of the Tilt Angle of All-Glass Vacuum Tube Collectors on the Thermal Performance of Tube Solar Water Heaters

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Abstract:

The present work corresponds to a numerical study based on Computational Fluid Dynamics to determine the influence exerted by the tilt angle of all-glass vacuum tube collectors in order to find the optimal performance of tube solar water heaters. Numerical simulations in transient state were developed to a passive 100 lt. tube solar water heater for tilt angles of 10o, 20o, 30o and 45o in order to determine the fluid dynamic and thermal behavior at theoretical and real environmental hourly conditions. Results obtained determined that angles that ranges between 10o and 20o exhibit the best fluid and thermal performance due to a high stratification index occurring at low inclination angles. This conclusion is favored in tropical regions where the annual solar irradiation is more intense than intertropical regions.

Keywords : Solar-thermal Energy, Computational Fluid Dynamics, Energy Storage, Stratification.

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Sliding Mode Control of a Five-Phase Series-Connected Two-Motor Drive

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Abstract— In this work, we study vector control and sliding mode control of series-connected five-phase two asynchronous machines supplied with a three levels inverter. After presentation of multiphase machines, we worked out the mathematical model of five phase asynchronous machine supplied with voltage inverter. Application of Park transformation reduces considerably the mathematical model of machine. After, we applied vector control and sliding mode control to the five-phase induction machine. After that, we study a multi-machine system which comport five-phase two asynchronous machines supplied with a single voltage inverter.

In the last, we had the independent vector control and the sliding mode control of series-connected five-phase two asynchronous machines. We observe that an appropriate transposition of phase's order permits an independent control of two machines.

Keywords— Five-phase, asynchronous machine,multi-machine systems, phase's transposition, vector control, sliding mode control

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Modeling of quartz bursting test at high temperature

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***Abstract*—**This work is studying the behavior of silica (sandstone, quartz) at high temperature which will be used later as raw material for obtaining metallurgical grade silicon (MG-Si) for photovoltaic application. This, aims to study the thermo-mechanical properties of silica as a raw material for carbothermic process.

The main objective of this work is to apply the modeling on the behavior of silica (sandstones and quartz) at high temperature in order to determine the influence of the operating parameters which govern the carbothermic for the obtaining of the silicon metallurgical grade for photovoltaic application

We carried out tests of silica bursts in a muffle furnace in order to determine silica thermal and mechanical characteristics, namely the friability index (FI), the Heat index (HI) and the strength thermal index (STI).

Using HIDE software we have developed a numerical model by Design of Experiments method which simulates the silica behavior at high temperature to determine the influence of mechanical and heat treatments as well as the influence of the interaction between them.

This method can predict the optimal use of this silica as raw material on carbothermic process in the submerged arc furnace.

Keywords*-component; formatting Quartz; DOE; Carbothermic; Silicon.*

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Electronic and Magnetic Properties of Carbone Nanoribbons by siesta code

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Abstract— Electronic and magnetic properties of carbone nanoribons are studied using siesta code within density functional theory. In this, work, we have studied two different geometric configurations; armchair and zigzag nanoribbons. We found that the armchair nanoribbons are non magnetic semiconductor in which the gap energy shrinks linearly with increasing width to reach the graphene value. For the zigzag configuration, a metallic behaviour is observed with relatively high magnetic moment at the edges of the nanoribbon, and then decreases for the inner atoms. The atomic spin moments at the edges are arranged with antiferromagnetic setting. In this study, we have found that the magnetic properties of the nanoribbons are directly linked to atoms edges arrangement.

Keywords; Carbone nanoribons, siesta, Magnetic properties

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Air conditioning based on solar reactivated desiccant cooling systems

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Abstract

Desiccant cooling installations reactivated by solar energy or heat waste appear actually as a promising and interesting solution to minimize CFC emissions due to air classic air conditioning systems. The offer mentioned type of installations relay on the use of the following components: the desiccators, the heat exchangers, the humidifiers and the solar captures. This study focuses on the principal component of these installations; the desiccant bed. Multiple studies discussing the performances of the desiccators are available on literature, but all these studies neglect the viscous dissipation effects occurring among it. In this paper, a numerical code dedicated for flow and heat and mass transfers in the desiccators and accounting for the viscous dissipation is developed. Differences between taking these effects into consideration or not are analyzed. Besides, an optimization study of the desiccators design, based on volume and form factor variation, is carried.

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Power quality improvement with a UPLM fed by PV system with hybrid supercapacitors batteries energy storage system

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Abstract—Currently, power quality problems have received increasing attentions in recent years due to proliferation of nonlinear and sensitive loads as well as unpredictable and unavoidable system faults. Power quality problems mainly include current and voltage harmonics, reactive power, supply unbalance, sag, swell, overvoltage, under voltage etc. Among renewable energy systems, a great deal of research has been conducted especially on photovoltaic effect in the recent day. Universal power line Manager (UPLM) have been one of the main topic of interest for researchers working in the area of power quality improvement and active power filters (APF). UPLM provides cost-effective solution as compared to standalone active filters and are preferred to compensate both voltage and current type harmonics. This study presents a simplified control strategy for the universal power line manager fed by photovoltaic (PV) system connected to the hybrid storage system with added functionality of compensating voltage sag, swell and unbalance. The hybrid energy storage system consists of two storage devices (a Lead Acid batteries modules and a supercapacitor (SC) bank) in the proposed structure as a high-energy high-power density storage device to supply continuous energy to the load when there is inadequate solar irradiation. The proposed new power line manager with a photovoltaic (PV) system consists of a combination of the control system of a unified power quality conditioner (UPQC), power flow control, and a frequency regulator. According to the analyzes, the proposed unified power line manager don't exports only the photovoltaic power to the grid using a boost converter, perturbed and observed maximum power point tracking algorithm through the UPQC function, but also to compensate power quality issues like voltage sags, swells, voltage unbalance, reactive currents and current harmonics. The control strategy of the proposed UPLM employs the instantaneous reactive power theory to estimate the fundamental component as well as the harmonic components of the source voltage and the load current of a power distribution system. The proposed model of UPLM fed by PV system with hybrid storage system is developed and simulated in MATLAB/SIMULINK environment. The performances of such system are validated through extensive simulation studies.

Keywords—Power quality, Unified power line manager , PV system, Hybrid storage system, Lead Acid batteries, Supercapacitor, THD active power filter.

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Physical properties investigation of $Zn_{(1-x)}S:Pb_x$ thin films prepared by ultrasonic spray technique via controlled Pb doping

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***Abstract*—** The main goal of this study is to investigate the effect of Pb doping content in the structural, optical and electrical properties of ZnS for enhanced photovoltaic applications. A systematic study was conducted to reveal the effects of different Pb doping concentration on the structural, transmittance in the visible spectra range, energy band gaps and electrical properties of the prepared films. The obtained results confirm that prepared $Zn_{(1-x)}S:Pb_x$ thin films can be used as a perfect alternative window material or buffer layer to ZnS for improved solar cell devices performances.

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Tradeoffs between Real-Time Signal Processing Architectures

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***Abstract*—** In this paper reviews the relative strengths and weaknesses of Digital Signal Processor (DSP), Field Programmable Gate Array (FPGA) and Application-Specific Integrated Circuit (ASIC) technologies for embedded applications. it includes a feasibility research that evaluates the benefits of three of the three most popular architectures in a direct-comparison format using different evaluating criteria; Time to Market, Performance, Price, Development Ease, Power and Feature Flexibility.

Keywords*—Comparison; FPGA; DSP; ASIC; Arcitecture*