



**List of Applicants**

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**Table of Content:**

S. No.	Particulars	Page Numbers
1.	Preface	3
2.	Keynote Description	4
3.	List of Presenters	5-20
4.	List of Listeners	20-23
5.	Upcoming Conferences	23-24



## **Preface:**

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## **KEYNOTE SPEAKER**



**Prof. Paulo Alexandre Gonçalves Piloto**  
**Department of Applied Mechanics, Polytechnic Institute of Bragança**  
**Bragança, Portugal**

Paulo Alexandre Gonçalves Piloto has a degree in Mechanical Engineering from the Faculty of Engineering – University of Porto (FEUP, 1991), Master Science degree in Mechanical Engineering from the Technical University of Lisbon (IST, 1994) and a Ph.D. degree in Mechanical Engineering (FEUP, 2001). He is currently coordinator professor at the Department of Applied Mechanics – Polytechnic Institute of Bragança (IPB) – Portugal and invited associate professor at the University of Coimbra – Portugal, having performed other professional activities in business and university environment. Develops the research activity in the field of fire and structural engineering, [participating](#) as a permanent researcher at LAETA INEGI (Portugal). He is also an associate researcher at the research unit from the University of Salamanca (Spain) “Art, architecture, Urbanism, and Engineering (Centuries XIX-XXI)”. He is the author/co-author of several papers published in journals and congress proceedings. He made part of the organizing committee and scientific committee of several conferences. He participated in international and national research projects.

**Topic:** Load Bearing Capacity of LSF Walls under Fire Exposure

Mostak Ahmed  
ERCICSTR1809052

**A new interfacial bio-sensing approach for detecting aberrant protein phosphorylation in cancer**

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**Abstract**

Protein phosphorylation is one of the most prominent post-translational mechanisms for protein regulation, which is frequently impaired in cancer. Through the covalent addition of phosphate groups to certain amino-acids, the interactions of former residues with nearby amino-acids are drastically altered, resulting in major changes of protein conformation that impacts its biological function. Herein, we report that these conformational changes can also disturb the protein's ability to interact with and adsorb onto bare gold surfaces. Based on the direct interaction of proteins with the gold interface, we further developed an extremely simple method for aberrant phosphorylation detection that circumvents the current need for phospho-specific antibodies. The novel interfacial bio-sensing method, which only requires 50 ng of purified protein, was applied to EGFR phosphorylation analysis in several lung cancer cell lines and also enabled monitoring their cell sensitivity to tyrosine kinase inhibitors (TKI) — a drug frequently used in the clinic for lung cancer treatment.



Ajayi,  
**Opeyemi Ayodele**  
ERCICSTR1809055

**Optical Fiber And Wireless Internet Connectivity In Nigerian Telecommunication System**

**Ajayi, Opeyemi Ayodele**  
Alumnus Of Federal University Of Technology Akure, Nigeria

**Abstract**

The information age has made technology, particularly information and communication technology, indispensable. Nigeria is often identified as the faster moving economy and one of the most advanced ICT market sectors in the Africa (BBC Report, 2006). It has the largest population in Africa, also making it an attractive and big market. Telecommunication infrastructure remains one of the major issues affecting technology development required for growth and development in Nigeria.

There has however been growth and development in infrastructure over

the past few years. Nigeria has certainly left the telecom state where there were only a few dial-up-e-mails provides and Internet Service Providers (ISPs) as well as when Nigerian Telecommunication Limited (NITEL) was the only Telecommunications operators. It was a dark era characterized by slow internet links, poor service, high cost, lack of infrastructure and an unprogressive telecoms monopoly. Things have certainly changed.

Deregulation of the telecommunication sector led to emergence of major global system of mobile communication operators in the country. Government had earlier provided the impetus for liberalization by setting up the Nigeria Communications Commission (NCC).

Nigeria fiber optic network is massive and very enterprising. The country presently has active submarine fiber optic cables connecting the country to the world.

Consequently, the Internet and its connectivity has gradually become a household concern. The connection to the Internet requires physical transfer of signal (data/information) from one point to another. This can either be through physical medium (wire) or through the air (wireless).

This study therefore investigates the growth, development and the economic impact of optical fiber and wireless internet connectivity in Nigerian telecommunications system, focusing on the current transmission technologies employed and data transmission speed. It also highlights the future prospects and challenges facing Telecom Technology across the Nation and seeked to identify which of the two technologies is better for signal transmission in terms of bandwidth utilization, performance, reliability, cost effectiveness, resilience, and security. This research also examined the optical fiber and wireless classifications, its applications in communication, structure and construction of optical fiber and wireless technologies.

The study adopted the use of secondary sources for the sourcing of materials. A lot of journal articles, research publications, textbooks, white papers and many more were critically studies and comparatively analyzed. It was clear that both media have hitches and challenges. The study showed that although initial cost of acquisition is an inhibitive factor for fiber optic connection, unlimited bandwidth delivery and high Quality of Service (QoS) placed Fiber optics above wireless connectivity in their overall performance.

It is finally concluded that the tremendous advancement in optical fiber and wireless internet connectivity as well as the resultant radical changes and advances in the techniques of data and information processing, storage, retrieval and dissemination in Nigeria within a decade is, no doubt, a revolution.

**Keywords:** Internet Connectivity, Optical Fiber, Quality of Service, Wireless Technology, Nigerian telecommunications Limited (NITEL).

#### Design and Construction of an Inverter for a Photovoltaic System

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#### Abstract

The work presented in this article aims to study and realize static converter. 24V DC / 200V AC. This last took us to realize two converters at the same time. The first stage of the conversion is a fly back type chopper (buck-boost) powered by a photovoltaic panel equipped with a printed circuit is the TL494 which generates us a PWM signal for the control of the two transistors used which allowed us to have voltage of



El Kebir Abdelkader  
ERICSTR1809056

	<p>300V adjustable with control loop that holds the constant tension whatever the influences of temperature and sunshine. This chopper feeds the second stage which is a DC / AC converter in MOSFET Transistor Bridge, each arm of the inverter is controlled by a power driver type IR2110 which transmits the microcontroller MLI control (16F877A) to the MOSFET. The latter provides a quasi-sinusoidal signal with a voltage of 220 V and a frequency of 50 Hz usable in everyday life Key words: Inverter, fly back chopper, MOSFET transistor, MLI, microcontroller, transformer, TCI routing software, PROTEUS simulation software, Pico scope</p> <hr/> <p style="text-align: center;"><b>Control of a Ventilated Electric Furnace by State Return Using the Kalman Reconstructor</b></p> <p style="text-align: center;"><b>El Kebir Abdelkader</b> Department of Electro Technique, University of Stambouli, Mascara, Mascara, Algeria</p> <p style="text-align: center;">Abstract</p> <p>The efficiency of an oven depends on the choice of a control strategy. The performance of a temperature controller of a furnace must be supplemented by a safety of the heating resistances from where the utility of a robust control in order to improve the control and the maintenance of this temperature. The applications of the Kalman filter are numerous in the engineering trades; that of process engineering is no exception to this rule. Stateful feedback control with integration using the Kalman reconstructor is the method sought in this article. A state control law is synthesized for setting the temperature of an electric furnace. This command is coupled to a stochastic process observer whose principle is to correct the model's trajectory by combining the observations with the information provided by the model so as to minimize the error between the measured output and the estimated output. Keywords – Electric furnace Modelisation, Integral control, Kalman filter, observably</p>
<p><b>Fawzia Taieb Brahimi</b> ERCICSTR1809057</p>	<p style="text-align: center;"><b>Synthesis Of Some Novel Class Of Amino- Heterocyclic Derivatives Of Algerian's Ricinoleic Acid Extract And Their Pharmacological Screening.</b></p> <p style="text-align: center;"><b>Fawzia Taieb Brahimi</b> Ecole Supérieure De Génie Electrique Et Energétique, Oran ,Algérie</p> <p style="text-align: center;"><b>Fatima Belkhadem</b> Faculté De Chimie, Usto-Mb, Oran, Algeria</p> <p style="text-align: center;"><b>Adil Ali Othman</b> Faculté De Chimieusto-Mb, Oran, Algeria</p> <p style="text-align: center;">Abstract</p> <p>The ricinoleiate triglyceride was extracted from castor-oil seeds grown in Algeria and isolated by catalytically methanolyse to methyl ricinoleiate. Three diazole derivatives of ricinoleic acid: 4-N-amino-1, 2, 4-triazole-5-thiol, 5-amino- 1, 3, 4-oxadiazole and 5-amino- 1, 3, 4-thiadiazole, have been synthesized and characterized. The investigation of antibacterial, antifungal and antioxidant screening data revealed that all the tested compounds showed good to moderate inhibition. The good activity is attributed to the presence of pharmacologically active groups NH-CS-NH, C = O and C = S attached to the heterocyclic nuclei (triazoles, oxadiazoles</p>

	<p>and thiadiazoles). The presence of amine functions (NH<sub>2</sub>) provides the tested molecules a higher activity on mushrooms than those of other products. The activity ingredient antiradical compounds power noted for: Castor oil &gt; Ester &gt;Amino-oxadiazole &gt;Amino-triazole &gt;Amino-thiadiazole &gt;.</p> <p><b>Keywords</b> Castor oil, ricinoleiate triglyceride, diazole, extraction, pharmacological screening.</p>
<p><b>Ghouas Halima</b> <b>ERCICSTR1809058</b></p>	<p><b>Extraction And Desextraction Of Fulvic Acid By Coacervate</b> <b>Halima. Ghouas : Mca Ecole Supérieure En Génie Electrique Et Energétique</b> <b>D'Oran Esgeeo.</b> <b>Boumediene. Haddou : Professeur Université Des Sciences Et De La Technologie</b></p> <p><b>Mohamed Boudiaf Oran.</b> <b>-Laboratoire De Physico-Chimie Des Matériaux Catalyse Et Environnement Ustomb. Laboratoire De Génie Électrique Et Matériaux Esgeeo.</b></p> <p><b>Abstract</b> Humic substances are polyelectrolytic macromolecules having high molecular weights They are significant in aquatic systems for several reasons. They give yellow brown color to water and can complex metals and organic pollutants such as pesticides . They are precursors to the formation of mutagenic halogenated compounds in water after chlorination . Especially fulvic acid represents the major advantage of the natural organic matter in soil and surface water . However, its presence in raw water can significantly affect the quality during the purification process . It is widely agreed that trihalomethanes (THMs),one of disinfection byproducts, can be generated by step chlo-rination in water treatment when they contain fulvic acid .Several researches have been carried out as an alternative for the degradation of aquatic humic substances. The present work concerns the study of cloud point extraction(CPE) as a method of recovery and valorization of fulvic acid of aqueous solution using the powerful solubilizing characteristic of nonionic surfactant aqueous solutions.This type of extraction used for example in environmental cleanup of industrial effluent or product concentration of fine chemicals for reuse. The surfactants used are alcohol polyethoxylate (Lutensol ON 30: n-C10E3) and alkylphenol polyethoxylate (Dowfax 20B102) types. Phase diagrams of binary water / surfactant and pseudo-binary (in the presence of solute) were plotted. The extraction results according to wt. % of surfactant and temperature are expressed by the four following response: percentage of solute extracted, E, residual concentrations of solute and surfactant in the dilute phase (X<sub>s,w</sub>, and X<sub>t,w</sub> respectively) and volume fraction of coacervate at the equilibrium (□). For each parameter, whose values are determined by an experimental design, these results are the subject of an empirical smoothing in three dimensions. The goal is to find the best compromise between E, which can be 99%, and (□) kept to a minimum, A comparison between experimental and calculated values allows models validation. Sodium sulfate, CTAB addition and pH effect were treated at the end of this work. the possibility of recycling the surfactant has been proved.</p> <p><b>Keywords:</b> Extraction, fulviic acid, surfactant, coacervate, cloud point.</p>
<p><b>Moncef Bari</b></p>	<p><b>Analysis of The Internet of Things (IoT): Requirements and Challenges</b></p>

<p>ERCICSTR1809059</p>	<p><b>Moncef Bari</b> Department of didactics,Universit du Quacbeca,Montracal, Canada</p> <p><b>Abstract</b> The Internet of things (IoT) is a recent phenomenon, which marks the extension of the Internet to things of the real world, usually through sensors, RFID... More and more of these real things are connected to the Internet, and inter-connected among them, exchanging data, allowing data exchange, sophisticated remote control and producing more integration between the virtual world and the real world. After reviewing the IoT concept and the important events that have marked this new area, the paper presents the current situation in 4 application domains (healthcare, education, environment and smart city) from the point of view of their requirements and discusses the challenges it is facing in each of that domains. Keywords—Internet of things, IoT, The Internet of things history, IoT challenges.</p>
 <p><b>Dongzhen Wang</b> ERCICSTR1809060</p>	<p><b>An Optimal Least Square Method for Object Location of High Precision Based on UAV</b></p> <p><b>Dongzhen Wang</b> Electrical and Information Engineering,Nanjing University of Aeronautics and Astronautics,Nanjing, China</p> <p><b>Abstract</b> With the wide applications of UAVs, it has become common to implement tasks such as rescue, monitoring using UAVs equipped with cameras. One of the core problems facing these tasks is object location. To achieve a location result of high precision is a challenge, for the existing of GPS error, angular sensors noise makes it hard to attain. Methods provided to deal with optimizing the positing results are mainly filtering methods, and non-linear least square methods, and as to the static object location, the least square method is most effective. However, when locating an object on a large ground plane, the least square method has a poor performance. The reason of which is that the position representation in Cartesian coordinate system is nonlinear with respect to the observation parameters and these parameters is insensitive to the object position. To overcome this problem, the polar coordinate system is used. After transformation of form of coordinate system respect to the object, the least square method can easily avoid above problem. Simulations and experiments are conducted showing that the proposed method is effective.</p>
 <p><b>Hanane EL-Halouani</b> ERCICSTR1809062</p>	<p><b>Chemical fertilizers and its effect on the quality of groundwater in the Tadla irrigated plain; Morocco</b></p> <p><b>Hanane EL-Halouani</b> Faculty of Sciences and Technologies,Univesity Sultan Moulay Slimane,Béni Mellal, Morocco</p> <p><b>Abstract</b> In Morocco, irrigated perimeters are threatened by diffuse nitric pollution of groundwater, which reduces the potential of water resources which are of good quality, thus creating a health risk for the population and socioeconomic developments in the country. Control of this pollution requires sufficient knowledge of the causes and mechanisms responsible for this problem.</p>

	<p>The Beni Mellal-Khénifra region suffers from the misuse of agrochemical inputs coupled with agricultural intensification and heavy pumping of groundwater, which is make water in the region of poor quality. Despite decades of efforts to reduce the release of pollutants into the environment, nutrient enrichment of aquatic environments remains an important issue, especially phosphates released into the environment, which come from agricultural sources (Fertilizers) and industrial wastes, human excreta and detergents or phosphate washed, and nitrates that turn into nitrites causing diseases that are in some cases fatal in newborns.</p> <p>In this context, this study has achieve to determined the effects of the use of fertilizers on the water quality of the Tadla aquifer, by carrying out various analyzes such as nitrates, nitrites and phosphates, whose results have allowed extracting polluted areas and unpolluted areas.</p> <p><b>Key words:</b> Tadla plain, groundwater, agriculture, nitrates, irrigation</p>
 <p><b>Ibrahim Yousif Ibrahim Abd alrhman</b> ERCICSTR1809065</p>	<p><b>Hamiltonian equations on <math>(2,0)</math>-jet bundles with constraints</b></p> <p><b>Ibrahim Yousif Ibrahim Abd alrhman</b> Department of mathematics - Faculty of Education ,West Kordufan University- Alnhoud City-Sudan</p> <p><b>Abstract</b></p> <p>The study concerns the Hamilton Equations <math>(2,0)</math>-jet bundles with constraints have been derived also important applications of Hamiltonian mechanical systems of the notions of <math>(2,0)</math>-jet bundles. Finally achieved that <math>(2,0)</math>-jet bundles have this systems in Mechanics and Physical Fields as well as in differential geometry.</p> <p><b>Key words:</b> geometry of holomorphic, <math>(2,0)</math> Jet bundle , constrained Hamiltonian Dynamics Introduction</p>
<p><b>Muqet Atique</b> ERCICSTR1809067</p>	<p><b>Bitcoin Reality Or Illusion? Should Consumers Invest In Bitcoin?</b></p> <p><b>Anika Shahzad</b> Faculty of Business Administration, Fast National University, Islamabad, Pakistan</p> <p><b>Muqet Atique</b> Faculty of Business Administration, Fast National University, Islamabad, Pakistan</p> <p><b>Mahveen Khan</b> Faculty of Business Administration, Fast National University, Islamabad, Pakistan</p> <p><b>Rabya Mohsin</b> Faculty of Business Administration, Fast National University, Islamabad, Pakistan</p> <p><b>Abstract</b></p> <p>This article analyses whether consumers should or should not invest in Bitcoin. This article emphasizes on the qualitative aspects related to Bitcoin, the major features, advantages, drawbacks, and potential developments regarding Bitcoin.</p> <p>The article talks about the opinions of people regarding Bitcoin usage. A user interview with many respondents reveal that many people believe that Bitcoin advantages such as Ease and Convenience are more beneficial, while on the other hand many respondents claim that there are more disadvantages associated like Privacy, Trust Issues, Anonymity,</p>

	<p>Security and Instability involved with Bitcoin system. Our findings have some implications for users, suggesting that how digital currency can or cannot be a better system than the old transaction processing system like banks in Pakistan Keywords: Bitcoin, cryptocurrency, Ease, Privacy, Anonymity, User investment</p>
 <p><b>Hastuti</b> ERCICSTR1809068</p>	<p><b>Kinetic and Thermodynamic Modified Pectin with Chitosan by Forming Polyelectrolit Complex Adsorbent to Remediate of Pb(II)</b></p> <p><b>Budi Hastuti</b> Department of Chemistry Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Jl. Ir. Sutami 36A Surakarta, 57126, Indonesia</p> <p><b>Mudasir</b> Department of Chemistry Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Jl. Ir. Sutami 36A Surakarta, 57126, Indonesia</p> <p><b>Dwi Siswanta</b> Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Gadjah Mada, Sekip Utara, Yogyakarta 55281, Indonesia</p> <p><b>Triyono</b> Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Gadjah Mada, Sekip Utara, Yogyakarta 55281, Indonesia</p> <p><b>Abstract</b> Biosorbent, such as pectin and chitosan, are usually produced with low physical stability, thus the materials need to be modified. In this research, the physical characteristic of adsorbent was increased by grafting chitosan using acetate carboxymethyl chitosan (CC). Further, CC and Pectin (Pec) were crosslinked using cross-linking agent BADGE (bis phenol A diglycidyl ether) to get CC-Pec-BADGE (CPB) adsorbent. The cross-linking processes aim to form stable structure and resistance on acidic media. Furthermore, in order to increase of the adsorption capacity in removing Pb(II), the adsorbent were added with NaCl to form macroporous adsorbent named CCPec-BADGE-Na (CPB-Na). The physical and chemical characteristics of porogenic adsorbent structure were characterized by scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FT-IR). The adsorption parameter of CPB-Na to adsorb Pb (II) ion was determined. The kinetics and thermodynamic of the bath sorption of Pb (II) on CPB-Na adsorbent and using chitosan and pectin as comparison were also studied. The results showed that the CPB-Na biosorbent was stable on acidic media. It had a rough and porous surface area, increased and gived higher sorption capacity for removal Pb(II) ion. The CPB-Na 1/1 and 1/3 adsorbent adsorbed Pb(II) with adsorption capacity of 45.48 mg/g and 45.97 mg/g respectively, whereas pectin and chitosan was of 39.20 mg /g and 24.67 mg /g respectively.</p> <p>Keywords: porogen, Pb(II), Pectin, Chitosan, Carboxymethyl Chitosan (CC) and CC- Pec-BADGE-Na</p>



Dyah Purwaningsih  
ERCICSTR1809069

### Synthesis of $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$ Doped Co, Ni, Cr and Its Characterization as Lithium Battery Cathode

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#### Abstract

Manganese dioxide ( $\text{MnO}_2$ ) and its derivatives are among the most widely used materials for positive electrode in both primary and rechargeable lithium batteries. The  $\text{MnO}_2$  derivative compound of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  (M: Co, Ni, Cr) is one of the leading candidates for positive electrode materials in lithium batteries as it is abundant, low cost and environmentally friendly. Over the years, synthesis of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  (M: Co, Ni, Cr) has been carried out using various methods including sol-gel, gas condensation, spray pyrolysis, and ceramics. Problems with these various methods persist including high cost (so commercially inapplicable) and must be done at high temperature (environmentally unfriendly). This research aims to: (1) synthesize  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  (M: Co, Ni, Cr) by reflux technique; (2) develop microstructure analysis method from XRD Powder  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  data with two-stage method; (3) study the electrical conductivity of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$ .

This research developed the synthesis of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  (M: Co, Ni, Cr) with reflux. The materials consisting of  $\text{Mn}(\text{CH}_3\text{COOH})_2 \cdot 4\text{H}_2\text{O}$  and  $\text{Na}_2\text{S}_2\text{O}_8$  were refluxed for 10 hours at  $120^\circ\text{C}$  to form  $\beta\text{-MnO}_2$ . The doping of Co, Ni and Cr were carried out using solid state method with  $\text{LiOH}$  to form  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$ . The instruments used included XRD, SEM-EDX, XPS, TEM, SAA, TG/DTA, FTIR, LCR meter and eight-channel battery analyzer. Microstructure analysis of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  was carried out on XRD powder data by two-stage method using FullProf program integrated in WinPlotR and Oscail Program as well as on binding energy data from XPS. The morphology of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  was studied with SEM-EDX, TEM and SAA. The thermal stability test was performed with TG/DTA, the electrical conductivity was studied from the LCR meter data. The specific capacity of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  as lithium battery cathode was tested using an eight-channel battery analyzer.

The results showed that the synthesis of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  (M: Co, Ni, Cr) was successfully carried out by reflux. The optimal temperature of calcination is  $750^\circ\text{C}$ . XRD characterization shows that  $\text{LiMn}_2\text{O}_4$  has a cubic crystal structure with  $\text{Fd}\bar{3}m$  space group. By using the CheckCell in the WinPlotR, the increase of Li/Mn mole ratio does not result in changes in the  $\text{LiMn}_2\text{O}_4$  crystal structure. The doping of Co, Ni and Cr on  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  ( $x = 0.02; 0.04; 0; 0.6; 0.08; 0.10$ ) does not change the cubic crystal structure of  $\text{Fd}\bar{3}m$ . All the formed crystals are polycrystals with the size of 100-450 nm. Characterization of  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  (M: Co, Ni, Cr) microstructure by two-stage method shows the shrinkage of lattice parameter and cell volume. Based on its range of capacitance, the conductivity obtained at  $\text{LiM}_x\text{Mn}_{2-x}\text{O}_4$  (M: Co, Ni, Cr) is an ionic

	<p>conductivity with varying capacitance. The specific battery capacity at a voltage of 4799.7 mV for LiMn<sub>2</sub>O<sub>4</sub>; Li<sub>1.08</sub>Mn<sub>1.92</sub>O<sub>4</sub>; LiCo<sub>0.1</sub>Mn<sub>1.90</sub>O<sub>4</sub>; LiNi<sub>0.1</sub>Mn<sub>1.90</sub>O<sub>4</sub> and LiCr<sub>0.1</sub>Mn<sub>1.90</sub>O<sub>4</sub> are 88.62 mAh/g; 2.73 mAh/g; 89.39 mAh/g; 85.15 mAh/g; and 1.48 mAh/g respectively. Keywords: LiM<sub>x</sub>Mn<sub>2-x</sub>O<sub>4</sub>, solid-state, reflux, two-stage method, ionic conductivity, specific capacity.</p>
<p><b>Mohammad Rahim Rahimi</b> ERCICSTR1809070</p>	<p><b>Building Information Management Advantages, Adaptation and Challenges of Implementation in Kabul Metropolitan Area</b></p> <p><b>Mohammad Rahim Rahimi</b> Civil and Environmental Engineering, Kumamoto university, Kumamoto, Japan</p> <p><b>Yuji Hoshino</b> Civil and Environmental Engineering, Kumamoto university, Kumamoto, Japan</p> <p><b>Abstract</b></p> <p>Building Information Management (BIM) at recent years has widespread consideration on the Architecture, Engineering and Construction (AEC). BIM has been bringing innovation in AEC industry and has the ability to improve the construction industry with high quality, reduction time and budget of project. Meanwhile, BIM support model and process in AEC industry, the process include the project time cycle, estimating, delivery and generally the way of management of project but not limited to those. This research carried the BIM advantages, adaptation and challenges of implementation in Kabul region. Capital Region Independence Development Authority (CRIDA) have responsibilities to implement the development projects in Kabul region. The method of study were considers on advantages and reasons of BIM performance in Afghanistan based on online survey and data. Besides that, five projects were studied, the reason of consideration were many times design revises and changes. Although, most of the projects had problems regard to designing and implementation stage, hence in canal project was discussed in detail with the main reason of problems. Which were many time changes and revises due to the lack of information, planning, and management. In addition, two projects based on BIM utilization in Japan were also discussed. The Shinsuizenji Station and Oita River dam projects. Those are implemented and implementing consequently according to the BIM requirements. The investigation focused on BIM usage, project implementation process. Eventually, the projects were the comparison with CRIDA and BIM utilization in Japan. The comparison will focus on the using of the model and the way of solving the problems based upon on the BIM. In conclusion, that BIM had capacity to prevent many times design changes and revises. On behalf of achievement those objectives are required to focused on data management and sharing, BIM training and using new technology.</p> <p>Keywords— construction information management, implementation and adaptation of BIM, project management, developing countries</p>
<p><b>Muluken Eshetu Tefera</b> ERCICSTR1809072</p>	<p><b>An Integrated Sequential Production of Bio-Ethanol, Biodiesel and Briquette from Spent Coffee Ground</b></p> <p><b>Muluken Eshetu Tefera</b> School of Chemical Engineering, Jimma University, Jimma Institute of Technology, Jimma/Ethiopia</p>

	<p style="text-align: center;"><b>Abstract</b></p> <p>In this study, biodiesel, bioethanol and briquette samples were sequentially produced from spent coffee ground. The oil extracted from spent coffee ground with solvent extraction route at hexane to spent coffee ground ratio of 22.5g/g with an extraction time of 30.4min resulting in 11.892% of oil yield. This was comparable with literature values and subsequently used for biodiesel production experiments using a 1% by wt of NaOH at reaction temperatures and residence times ranging from 50 to 65 °C and 20 to 60min, respectively. The optimization carried out using central composite design methodology gave 81.507% of methyl-ester yield at a reaction temperature of 57.133 °C and reaction time (residence time) of 45.117 min with model determination coefficient (R<sup>2</sup>) of 0.9465 while the optimum reducing sugar yield for dilute acid hydrolysis experiments for ranges of operating parameters of temperature (70-100 °C) and (1-3M) of H<sub>2</sub>SO<sub>4</sub> concentrations was found to be 39.161% at a temperature of 98.313°C and H<sub>2</sub>SO<sub>4</sub> acid concentration of 2.962M. Experiments were conducted at the predicted optimum conditions and resulted 79.65% of biodiesel yield (out of 11.892g of oil) and reducing sugars yield of 37.28 % (out of the hydrolysate). The bio ethanol produced by simple distillation having alcohol by volume yield of 55% can be considered as a good result and it can be easily concentrated to a fuel grade ethanol by using fractionating column. Moreover, the characteristics of the biodiesel produced were in good agreement with ASTM and EN standards. The end product of the process; briquette has been produced from 75% wt of dilute acid hydrolysis residue and 25% wt of glycerol, resulted a calorific value of 13.35MJ/kg, with its easy mold -ability. This study signifies the value addition that can be affected from spent coffee ground and results obtained in this regard are discussed.</p>
<p><b>Abdulrahman Alenezi</b> <b>ERCICSTR1809073</b></p>	<p style="text-align: center;"><b>Flow physics and heat transfer characteristics of jet impinging on a heated flat surface</b></p> <p style="text-align: center;"><b>Abdulrahman Alenezi</b> <b>Mechanical Power and Refrigeration, College of Technological Studies, Kuwait</b></p> <p style="text-align: center;"><b>Abstract</b></p> <p>Cooling by impingement jet is known to have a significant high heat transfer rate which makes it widely used in industrial cooling systems. This research paper numerically investigates heat transfer characteristics on an isothermal flat surface using computational fluid dynamics for orthogonal and inclined impinging jets. Four jet-to-target distances (H/D), 2, 4, 6, and 8 respectively were employed in this study. In addition, four jet angles (<math>\alpha</math>) of 45°, 60°, 75° and 90° using air as working fluids were also employed in this study. A full analysis of the effect of both turbulence models and mesh sizes is reported for all jet to target distances and jet angles. This paper should help understanding the flow physics in jet impingement problems. The numerical values were validated against the experimental data of O'Donovan, 2007. A total of 16 simulated cases were investigated in this research paper.</p> <p>This research paper investigates not only the effect of jet-to-target distances but also the effect of changing jet angles on the flow physics under the influence of Re=20,000.</p>



Nadia RASSAI  
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**Valorization of straw waste by co-firing coal and straw in swirling stabilized burner**

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**Abstract**

The purpose of the current study is to valorize straw waste by co-firing coal and straw in a swirl-stabilized reactor in order to produce a clean energy. To fulfill this purpose, a comprehensive computational fluid dynamics (CFD) modeling of co-firing coal and straw was presented, in which the pulverized straw particles and coal particles are independently injected into the burner through two concentric injection tubes. The numerical approach is based on Reynolds averaged Navier–Stokes (RANS) approach using the realizable  $k-\epsilon$  turbulence model for turbulence, the non-premixed combustion model for gas phase combustion, the Lagrangian approach (DPM) for the discrete second and the DO for radiation . The finding results show a good agreement with numerical and experimental data.

**Keywords:** Coal; straw; pulverized; co-firing; swirling.



Adel Gürel  
ERCICSTR1809076

**The Transformation Of Architecture Through The Technological Developments In History: Future Architecture Scenario**

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**Abstract**

Nowadays, design and architecture are being affected and underwent change with the rapid advancements in technology, economics, politics, society and culture. Architecture has been transforming with the latest developments after the inclusion of computers into design. Integration of design into computational environment has revolutionized the architecture and new perspectives in architecture have been gained. The history of architecture shows the various technological developments and changes in which the architecture has transformed within time. Therefore, the analysis of integration between technology and the history of architectural process makes it possible to build a consensus on the idea of how architecture is to proceed. In this study, each period that occurs with the integration of technology into architecture is addressed within historical process. At the same time, changes in architecture via technology are identified as important milestones and predictions with regards to the future of architecture have been determined. Developments and changes in technology and the use of technology in architecture within years are analysed in charts and graphs comparatively. The historical process of architecture and its transformation via technology are supported with detailed literature review and they are consolidated with the examination of focal points of 20th century architecture under the titles; parametric design, genetic architecture, simulation and biomimicry. It is concluded that with the historical research between past and present; the developments in architecture cannot keep up with the advancements

	<p>in technology and recent developments in technology overshadows the architecture, even the technology decides the direction of architecture. As a result, a scenario is presented with regards to the reach of technology in the future of architecture and the role of the architect.</p> <p><b>Keywords</b> : Computer Technologies, Future Architecture, Transformation, Scientific Developments, Historical Process</p>
 <p><b>Saptono Hadi</b> ERCICSTR1809077</p>	<p><b>Study of heavy metal impurities in facial cosmetic products available in local market of Indonesia</b></p> <p><b>Saptono Hadi</b> Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Universitas Sebelas Maret, Indonesia</p> <p><b>Abstract</b></p> <p>The presence of heavy metals impurities in facial cosmetics has becomes current issue in developing countries. Concern is mainly due to potential long-term toxic effects of heavy metals in cosmetics products to humans. In this study, the levels of toxic metal Cadmium (Cd) in different facial cosmetic products sold at in local shop in Surakarta, Indonesia was assessed. The cosmetic items included lipstick, eye shadow, face powder, and skin lightening creams of various prices. The cosmetics were acid digested and analyzed for heavy metals cadmium in triplicate using a flame atomic absorption spectrophotometer. The method was validated for linearity and range, precision, accuracy, limit of detection (LOD) and limit of quantification (LOQ). The results of this study showed that metals impurities Cd was detected in all cosmetics samples in the level of the concentrations of mg kg<sup>-1</sup>. The detectable Cd level however was found below the acceptable limit. Furthermore test showed no statistical significant difference in concentrations of Cd between the expensive and cheap cosmetic products. The results indicate that the concentrations of toxic metal Cd in these facial cosmetic pose no considerable risk to the users. However, chronic exposure of the metal might possible from the continued use of the products.</p> <p><b>Keywords:</b> Cadmium, facial cosmetics products, atomic absorption spectrophotometer</p>
<p><b>Surbhi Sharma</b> ERCICSTR1809085</p>	<p><b>Effect of Te additive on thermal stability and glass forming tendency of Ge-Sn-Se chalcogenide glass system</b></p> <p><b>Surbhi Sharma</b> Kanya Maha Vidyalaya, Jalandhar, Punjab, India, physurbhi@gmail.com</p> <p><b>Navjeet Sharma</b> D.A.V. College, Jalandhar, Punjab, India</p> <p><b>Amit Sarin</b> I.K.G. Punjab Technical University, Kapurthala, Punjab, India</p> <p><b>Abstract</b></p> <p>Thermal characterization of Ge<sub>20</sub>Sn<sub>10</sub>Se<sub>70-x</sub>Tex (x = 0, 3, 6, 9, 12, 15) glass system has been undertaken in the present research work. Dependence of glass transition temperature and thermal stability on glass composition has been established via DSC technique. Fundamental kinetic parameters viz. glass transition temperature T<sub>g</sub>, Hruby parameter Hr, crystallization temperature T<sub>c</sub> etc., have been experimentally calculated under non isothermal conditions at the constant heating rate of 100C. DSC traces shows higher difference between crystallization</p>

	<p>temperature <math>T_c</math> and glass transition temperature <math>T_g</math> which suggests the greater glass forming tendency and resistance towards crystallization. Glasses under study shows good thermal stability, hence, can find practical applications especially in phase change optical memory.  <b>Keywords:</b> Chalcogenide glasses, thermal properties, Differential scanning calorimetric technique, thermal stability, glass forming tendency.</p>
 <p><b>Chairul Salam</b> ERCICSTR1809087</p>	<p><b>Coal Mining Accidents in Indonesia, Risk Assessment Prediction</b></p> <p><b>Chairul Salam</b> Mining Engineering, Istanbul Technical University, Istanbul, Turkey</p> <p><b>Abstract</b>  For all forethought, mining persist the eminent unsafe work activity, and in Indonesia, coal mining industry is one of the most unsafe work for occupational injuries. Injuries are refined cases with many components that influence activity, and statistical investigation of injury records able to acquire worthwhile entropy that could avoid such injuries. In this research, a regression analysis method was employed occupational accidents in Indonesian coal mine during 2016. The injuries data were classified as working time, location area, age, job experience, position, cause of accidents and regression statistic method was applied for data analysis. Regression analysis was applied to indicate the amount of injuries that ensued in categories. It is initiated that the work with the most eminent measurement of accidents was the operators in the mine pits because of act as not secure as the cause of accidents. The workers were principally disclosed to injuries actuated by dangerous work environment, and the down motivation as a personal factor have the most eminent risks. At last, a formula for estimating the amount aspect of accidents was deduced. Then, the formula was employed to define the crucial accident components. Risk assessment analysis management was fulfilled using stiffness, likelihood and vulnerability element. Matrix of hazardous were acquired and the most dangerous often accident aims were established with equivalence in Indonesian coal mines. Likelihood analytical was determined to realize accident anticipation and certainty in a fortuity time. Stiffness element model were established with artificial neural network. Data collection was able for future accident prediction.</p>
<p><b>Gamer AlHassan</b> ERCICSTR1809095</p>	<p><b>The Magic of Shrooms: From Ancient Cultures to Modern Neurology</b></p> <p><b>Gamer AlHassan</b> College of Sciences, University of Central Florida, Orlando, Florida, United States of America</p> <p><b>Abstract</b>  This research explores the relationship between psilocybe cubensis also commonly known as psilocybin, the active ingredient in “magic mushrooms”—and the formation and alteration of neural networks as well as the possible influence upon neurogenesis. Psilocybin has been classified by the U.S government as an illegal substance since the 1960s, effectively curbing most research on the drug. Attitudes towards psilocybin in the rest of the world have varied, many cultures have used the drug for centuries in religious and medical endeavors. Recently, research has shown that psilocybin has profound influences on the brain outside of its hallucinogenic effects, rather, neurotransmitters are heavily excited by the introduction of this chemical into the body. Due to this phenomenon the question of whether or not psilocybin can be used for</p>

generating new neural networks and hippocampal neurons arose. This gave a new perspective on the once illegal substance that can be potentially influential in neuromedical research. The organization of this research takes into account a multidisciplinary angle of both the physiological and anthropological influences of psilocybin. Physiologically, this research seeks to understand and further the connections between psilocybin and its effect on the human brain, specifically the alteration of neural networks and its probability of being a catalytic agent of neurogenesis. While also taking into account the anthropological perspective dealing with societal behaviors towards psilocybin and the dichotomy of stigmatization and appreciation throughout different cultures. Implications of this project highlight the potential medical use of psilocybin while also respecting its cultural significance. seeks to understand and further the connections between psilocybin and its effect on the human brain, specifically the alteration of neural networks and its probability of being a catalytic agent of neurogenesis. While also taking into account the anthropological perspective dealing with societal behaviors towards psilocybin and the dichotomy of stigmatization and appreciation throughout different cultures. Implications of this project highlight the potential medical use of psilocybin while also respecting its cultural significance.



Elza M M Fonseca  
ERCICSTR1809061

**Fire Behaviour Of Protected W-S-W Connections With A Steel Plate As The Central Member And Different Dowels Diameter**

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**Abstract**

The main objective of this work is to present wood-steel-wood (W-S-W) connections in double-shear, joined by steel dowel fasteners and a steel plate as the central member. For each studied connection, different dowel diameters and external applied tensile loads in fire situation shall be taken in account. Considering the rules presented in Eurocode 5, part 1-1 and 1-2, the calculated number of dowels will be arranged in lines and columns and carry out an imposed spacing between the connectors. This work is intended to study the W-S-W connection exposed to fire using the standard curve ISO834. In the wood plates will be used a glue laminated wood, as yellow birch, with characteristics equals to GL28H. For protected connections three types of gypsum will be used in order to obtain a better insulation. Simplified equations from Eurocode 5, part 1-1 and 1-2, will be used to verify the behaviour of the connections at high temperature. A numerical procedure based on finite element method was also implemented to produce simulations focused on thermal analysis. The comparison of several results between analytical and numerical calculations showed a favourable accordance. The numerical model permits verify the effect of the steel dowels, steel plate and gypsum in the wood charring rate evolution. Even though the connection can resist for thirty minutes, is possible to observe the char layer both on protected and unprotected connection being the last the most affected.

**Keywords:** W-S-W connection, Wood, Steel, Gypsum, Dowel, Char layer, High temperature.



Prof. Paulo A. G. Piloto  
ERCICSTR1809064

### Load Bearing Capacity Of Lsf Walls Under Fire Exposure

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#### Abstract

Light steel frame and prefabricated panels are widely used in loadbearing walls, with direct application to steel framed buildings. These walls are made with steel cold formed sections (studs and tracks) using gypsum plasterboard, other material layers attached to the flanges and sometimes insulation material in the cavities. The fire resistance is usually provided by one or more layers of panels and also by the insulation material. This investigation evaluates the fire resistance of the loadbearing walls, from the point of view of insulation (I) and loadbearing capacity (R). Experimental tests were used to define the insulation criterion under fire. A numerical model was validated under the same fire conditions. The loadbearing capacity is determined using a hybrid model, based on experimental measurements. This model is able to predict an accurate fire resistance, taking into account the brittle behaviour of gypsum panels and the ignition of combustible materials.

Keywords: LSF walls, fire resistance, numerical simulation, experimental tests.

Al-Sayed A. Bakr  
ERCICSTR1809112

### Iron Removal from Aqueous Solutions by Fabricated Calcite Ooids

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#### Abstract

The precipitated low magnesium calcite ooids in assembled softening unit from natural Mediterranean seawater samples were used as adsorbent media in a comparative study with granular activated carbon media in a two separated single-media filtration vessels (operating in parallel) for removal of iron from aqueous solutions. In each vessel, the maximum bed capacity, which required to be filled, was 13.2 l and the bed filled in the vessels of ooids and GAC were 8.6, and 6.6 l, respectively. The operating conditions applied to the semi-pilot filtration unit were constant pH (7.5), different temperatures (293, 303 and 313 K), different flow rates (20, 30, 40, 50 and 60 l/min), different initial Fe(II) concentrations (15–105 mg/l) and the calculated adsorbent masses were 34.1 and 123 g/l for GAC and calcite ooids, respectively. At higher temperature (313 K) and higher flow rate (60 l/min), the maximum adsorption capacities for ferrous ions by GAC and calcite ooids filters were 3.87 and 1.29 mg/g and at lower flow rate (20 l/min), the maximum adsorption capacities were 2.21 and 3.95 mg/g, respectively. From the experimental data, Freundlich and Langmuir adsorption isotherms were used to verify the adsorption performance. Therefore, the calcite ooids could act as new highly effective

	<p>materials in iron removal from aqueous solutions. Keywords: Water treatment; Calcite ooids; Activated carbon; Fe(II) removal; Filtration.</p>
<p>Deniz Vurmaz ERCICSTR1809113</p>	<p>Next Generation Point-Of-Care Tools For Rapid Diagnostics Of Trauma</p> <p>Deniz Vurmaz, PhD Candidate Chemical and Biomolecular Engineering Department, NYU Tandon School of Engineering</p> <p>Abstract</p> <p>Today's healthcare delivery system focuses on late-stage disease diagnosis and, as a consequence, results in exceptionally high costs with poor outcomes in far too many cases. Recent developments in the -omics disciplines are starting to provide promising signatures of early disease detection. Likewise, advances in microfluidics, nanoscience, engineering, and artificial intelligence have the potential to drastically improve diagnostic systems. The need for rapid identification of organ failure after an accident is vital for immediate diagnosis, followed by the most relevant medical treatments.</p> <p>In the quest for fast identification of organ failure, the key is rapid and accurate detection of pertinent biomarkers that are facilitated by the diagnosis of organ injury, the severity of trauma, and the potential for complications of hemorrhage. A comprehensive specialized treatment of the victim at a trauma care service is crucial within an hour of the incident for enhanced survival. At the same time, the rapid diagnostics followed by the appropriate therapies are a significant driver of healthcare costs. In fact, in the United States, approximately 35 million people are treated every year for trauma injuries which translates into one hospitalization every 15 minutes. At an annual cost of \$67.3B, trauma is the 3rd most costly medical condition, behind heart disease (\$90.9B) and cancer (\$71.4B). Despite these facts, a highly effective point-of-care diagnostic device with analysis capabilities that facilitate the treatments is still profoundly absent. Our goal is to address this need by designing and implementing a highly affective chip-based detection system by integrating a wide variety of biomarkers. These biomarkers will include CRP, MYO, D-Dimer, Protein C, NGAL, KIM-1, HMGB-1, L-FABP, I-FABP, Procalcitonin, Complement 5, Properdin. Using these biomarkers, we propose to develop a novel application of a universal chip-based sensor platform thereby enabling real-time, multiplexed, quantitative screening of trauma related biomarker panels. Furthermore, the quantitative results generated will be utilized to train machine learning algorithms to facilitate an intuitive and versatile Trauma ScoreCard that could effectively be used by the healthcare practitioners. The diagnostic tool will include a sensor module involving a single use, credit card-sized plastic cartridge employing a sample input port, microfluidics module, reagent blisters, biomarker array, waste reservoir, and high specificity antibody reagents. By working with the surgeons and clinicians, the project will demonstrate the design, working principles and implementation of the diagnostic device under a variety of real-life trauma conditions.</p>

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- 2nd ICSTR Dubai – International Conference on Science & Technology Research, 26-27 December 2018
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