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Keynote Speakers



Dr. Mohammad Bin Ismail

Dr. Mohammad obtained his B.Sc. (Hons) Civil Eng. from University of Strathclyde, Glasgow, UK, M.Sc. (Eng) from University of Liverpool, UK and Ph.D. from Aston University, UK. He is a Professor at Faculty of Civil Engineering, Universiti Teknologi Malaysia (UTM). He teaches various subjects at under graduate and post graduate levels focusing on civil engineering materials, Concrete technology, Design and Structural assessment & repair. His research interests include concrete durability, corrosion of reinforcement, NDT and structural forensic engineering, sustainable construction materials and environmental engineering. He has published more than 70 papers for various journals, conference proceedings and keynote address. Among the positions held in UTM for the past 25 years are: Head of Department, Head of Laboratory and Chairman of committees and international conference. He is a member of BEM, MSSA, mSET, PERINTIS and PERKOM.



Dr. Babasaheb M. More

Associate Professor, Engineering Physics, BMIT, Belati, India



Dieff Vital
GIC1571052

**An inequality between the collective and individual
Times for completing a job**

Raemeon cowan
California State University, Northridge
18111 Nordhoff Street
Northridge, CA 91330
Raemeon.Cowan.183@my.csun.edu

Jose Pastrana
University of Puerto Rico
Ponce de Leon Avenue
San Juan, PR 00931
jose.pastrana@upr.edu

Aurel Stan
Ohio State University at Marion
1465 Mount Vernon Avenue
Marion, OH 43302
stan.7@osu.edu

Dieff Vital
Miami Dade College-Wolfson Campus
300 NE 2nd Avenue
Miami, FL 33132
dieff.vital001@mymdc.net

ABSTRACT

The inequality between the arithmetic and harmonic means of n positive numbers, can be interpreted as the fact that the time necessary for n workers, each working at a constant speed (productivity), to complete a job working together, is less than or equal to $1/n^2$ of the sum of the individual times required by the workers laboring alone to complete that job. We show first that if we consider n workers, who are becoming tired in time, and whose productivity decreases exponentially in time at a rate that depends only on the difficulty of the job performed, but not on the workers, then the above inequality still holds. The proof relies on Jensen inequality. Finally, we extend this result to the case in which we have n workers, becoming tired continuously in time, and whose order of productivity remains the same in time, that means, if worker 1 productivity is greater than worker 2 productivity at a certain time t_0 , then worker 2 productivity never exceeds worker 1 productivity.

Keywordsproductivity, Arithmetic{Geometric{Harmonic mean inequality, Jensen inequality



Safaa Ali
GIC1571053

Syntheses and Reactivity New Heteroleptic and Homoleptic Formamidinate Rare Earth Metals Complexes from Pseudo-Grignard Reaction

Safaa Ali¹,

College of Science, Technology & Engineering, Building 21, James Cook University, Townsville, Qld, 4811, Australia

Peter Junk

College of Science, Technology & Engineering, Building 21, James Cook University, Townsville, Qld, 4811, Australia

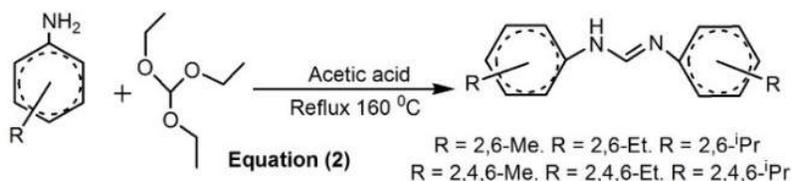
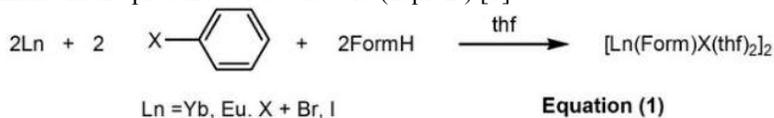
Jun Wang

**School of Chemistry, Monash University, Victoria, Australia
safaa.ali@my.jcu.edu.au**

ABSTRACT

Pseudo-Grignard reagents ^[1, 2], “RLnX” (Ln = Eu and Yb; R = Me, Ph or C₆H₂Me₃-2, 4, 6; X = Br, I), formed by the treatment of organic halides like PhBr or PhI with rare earth metals in Lewis base solvents, can be employed to various organic or inorganic transformations^[3, 4]. We now report the synthesis of new divalent rare earth metal formamidinate complex [Ln(Form)X(thf)₂]₂ through the relevant Pseudo-Grignard reactions of rare earth metal with bromobenzene and iodobenzene in the presence of formamidine species (Eq. 1).

N,N'-Bis(aryl)formamidines (ArN=CH-NHAr (Ar = aryl)) (Fig. 1.), can be easily synthesised in high yields by heating to reflux one equivalent of triethyl orthoformate with two equivalents of the appropriate substituted aniline in the presence of acetic acid (Eqn. 2.) [5].



A typical reaction using ytterbium and europium metals and bromobenzene or iodobenzene in the presence of one of the formamidine species led to the isolation wide range of coloured complexes [Yb(Form)X(thf)₂]₂ (Fig. 1).

Keywords: Pseudo-Grignard reagents, formamidinate, heteroleptic lanthanide compounds, rare earth complexes.

Please choose and underline: Invited (30 minutes), Oral (20 minutes), Short Oral (5 minutes + poster) or Poster presentation do you like.



A. Behera
GIC1571055

A Categorical Construction Of Minimal Model

A. Behera, S.B. Choudhury and M. Routaray
Department of Mathematics
National Institute of Technology
ROURKELA - 769 008 (India)
abehera@nitrkl.ac.in

ABSTRACT

It is to be emphasized that many algebraic and geometrical constructions in Algebraic Topology, Differential Topology, Differentiable Manifolds, Algebra, Analysis, Topology, etc., can be viewed as Adams completions or cocompletions of objects in suitable categories, with respect to carefully chosen sets of morphisms.

The notion of generalized completion (Adams completion) arose from a categorical completion process suggested by Adams [1, 2]. Originally this was considered for admissible categories and generalized homology (or cohomology) theories. Subsequently, this notion has been considered in a more general framework by Deleanu, Frei and Hilton [3], where an arbitrary category and an arbitrary set of morphisms of the category are considered; moreover they have also suggested the dual notion, namely the cocompletion (Adams cocompletion) of an object in a category.

The central idea of this note is to investigate a case showing how such an algebraic geometrical construction is characterized in terms of Adams cocompletion

Key words : Category of fractions, calculus of right fractions, Grothendieck universe, Adams cocompletion, differential graded algebra, minimal model



Chebrolu Venkata
GIC1571056

Time Varied Morphology Controllable Fabrication of NiS Nanosheets Structured Thin Film and its Application as a Counter Electrode for QDSSC

Chebrolu Venkata Thulasi-Varma, Chandu V. V. M. Gopi, S. Srinivasa Rao, Dinah Punnoose, Soo-Kyoung Kim, and Hee-Je Kim*
School of Electrical Engineering, Pusan National University, Gumjeong-Ku, Jangjeong-Dong, Busan 609-735, South Korea

ABSTRACT

A novel strategy has been successfully developed for highly efficient nanosheet-structured NiS counter electrodes. The NiS was deposited on FTO substrate with different deposition times using the simple and cost-effective chemical bath deposition technique. The NiS CEs were used to grow high quality thin films containing nanoparticles, nanosheets, or nanorods. The nanosheetstructured NiS CE in QDSSCs under one-sun illumination (AM 1.5, 100 Mw cm⁻²) yielded a high short circuit current density (J_{sc}) of 13.53 mA cm⁻², open circuit voltage (V_{oc}) of 0.570 V, fill factor (FF) of 0.450, and power conversion efficiency (η) of 3.47%. These values are much higher than those of the Pt CE (J_{sc} = 7.85 mA cm⁻², V_{oc} = 0.611, FF = 0.243, and η = 1.170%). The NiS was strongly adhered on the FTO substrate by acetic acid which acts as stabilizer and strong reagent in this one step preparation. The performance of NiS CE was improved by the surface morphology, which

	<p>enable rapid electron transport and a lower electron recombination rate for the polysulfide electrolyte redox couple. In the present study NiS has obtained higher electrocatalytic activity which plays a crucial role in the QDSSC. Electrochemical impedance spectroscopy and Tafel-polarization measurements were used to investigate the electrocatalytic activity of the NiS and Pt CEs.</p>
 <p>Moh. Malik Afandi GIC1571057</p>	<p>Optimization of Solar Energy Utilization Using Concentrated Solar Hybrid Energy Harvester (CSHEH) Based on Smart Solar Panel and Concentrated Thermoelectric Generator</p> <p>Moh. Malik Afandi Department of Electrical Engineering Institut Teknologi Sepuluh Nopember Surabaya, Indonesia afandi.malik1206@gmail.com</p> <p>Dinda Dwi Chandrarini Department of Statistics Institut Teknologi Sepuluh Nopember Surabaya, Indonesia dindadwice@gmail.com</p> <p>ABSTRACT</p> <p>Many forms of community activities and national industrial sector are highly dependent on the availability of electrical energy. Unfortunately, at the end of 2014 the electrification ratio in Indonesia is only 80.5%. On the other hand, Indonesia is a tropical country that has high intensity of sunlight almost 10 hours per day throughout the year. Indonesia has a solar energy intensity of 4.0-4.9 kWh/m². This condition is potentially to be used as an alternative source of electrical energy to cover the electricity shortage, particularly in areas which is difficult to reach by existing electricity power. This paper will discuss about optimization of solar energy utilization through Concentrated Solar Hybrid Energy Harvester (CSHEH). CSHEH consists of Smart Solar Panel and Thermoelectric Generator. CSHEH is able to convert the two energy generated by the sun into electrical energy that is photon energy through the photovoltaic effect of solar panel and heat energy through Seebeck effect of thermoelectric. In case, CSHEH is able to provide an alternative solution to produce electricity, especially in isolated areas. As well as being stand alone, the advantages of CSHEH also does not require operating costs, and environmentally friendly because it just utilize solar energy as a source.</p> <p>IndexTerms— Concentrated, Optimization, Smart Solar Panel, Thermoelectric</p>



Dinda Dwi Chandrarini
GIC1571057

Optimization of Solar Energy Utilization Using Concentrated Solar Hybrid Energy Harvester (CSHEH) Based on Smart Solar Panel and Concentrated Thermoelectric Generator

Moh. Malik Afandi
Department of Electrical Engineering
Institut Teknologi Sepuluh Nopember
Surabaya, Indonesia
afandi.malik1206@gmail.com

Dinda Dwi Chandrarini
Department of Statistics
Institut Teknologi Sepuluh Nopember
Surabaya, Indonesia
dindadwice@gmail.com

ABSTRACT

Many forms of community activities and national industrial sector are highly dependent on the availability of electrical energy. Unfortunately, at the end of 2014 the electrification ratio in Indonesia is only 80.5%. On the other hand, Indonesia is a tropical country that has high intensity of sunlight almost 10 hours per day throughout the year. Indonesia has a solar energy intensity of 4.0-4.9 kWh/m². This condition is potentially to be used as an alternative source of electrical energy to cover the electricity shortage, particularly in areas which is difficult to reach by existing electricity power. This paper will discuss about optimization of solar energy utilization through Concentrated Solar Hybrid Energy Harvester (CSHEH). CSHEH consists of Smart Solar Panel and Thermoelectric Generator. CSHEH is able to convert the two energy generated by the sun into electrical energy that is photon energy through the photovoltaic effect of solar panel and heat energy through Seebeck effect of thermoelectric. In case, CSHEH is able to provide an alternative solution to produce electricity, especially in isolated areas. As well as being stand alone, the advantages of CSHEH also does not require operating costs, and environmentally friendly because it just utilize solar energy as a source.

IndexTerms— Concentrated, Optimization, Smart Solar Panel, Thermoelectric



Vipin B. Gawande
GIC1571058

CFD Analysis of Solar Air Heater Having Artificial Roughness as Combination of Rectangular and Triangular Ribs on Absorber Plate

Vipin B. Gawande* Dr. A. S. Dhoble Dr. D. B. Zodpe
Department of Mechanical Engineering, Visvesvaraya National Institute of Technology, Nagpur, India

ABSTRACT

A two dimensional computational fluid dynamics (CFD) analysis of solar air heater has been carried out to investigate heat transfer augmentation and flow characteristics. Artificial roughness in the form of combined rectangular and triangular ribs has been provided on heated wall of the rectangular solar air heater duct. The analysis is carried out for relative roughness pitch in the range of 7.14 \leq P/e \leq 17.86 at constant relative roughness height (e/D =0.042). Reynolds number range, 3800-18000, which is relevant in solar air heater, has been used for analysis. Turbulent flow through artificially roughened solar air heater is simulated using finite-volume CFD code, ANSYS FLUENT. RNG k-e turbulence model is selected by comparing the predictions of various turbulence models with experimental results available in literature. The vortices generated around the ribs and grooves are thought to be responsible for the enhancement in heat transfer rate. The analysis conducted in this paper presents results about heat transfer and fluid friction in solar air heater duct for a given constant value of heat flux (1000 W/m²). Thermo hydraulic performance parameter considering heat transfer enhancement with same pumping power has been evaluated for optimum configuration of the roughness element for artificially roughened solar air heater. The optimum value of thermo-hydraulic performance parameter for combined rectangular and triangular ribs configuration for the range of parameters investigated in this paper has been found to be 1.86 corresponding to relative roughness pitch of 7.14, relative roughness height of 0.042 and Reynolds number of 18000.

Keywords: CFD; solar air heater; artificial roughness; thermo hydraulic performance parameter; friction factor; heat transfer.

Putri Agustin, Trio Fani
GIC1571059

Analysis of Methane Hydrate Formation that Include Important Role of Deep Sea Sediment, based on Kerek Formation, Central Java, Indonesia

Yan Bachtiar Muslih*

Hangga Wijaya*

Trio Fani*

Putri Agustin*

***Teknik Geologi, Universitas Diponegoro**

putriagustinesuria@gmail.com

ABSTRACT

Energy demand always increase about 5-6% each year, but conventional energy always decrease about 3-5% each year, it means that 20-30 year ahead, conventional energy can't fulfill all of energy demand in Indonesia, solution of this problem is unconventional energy, that is gas hydrate, gas hydrate is one of natural gas that form in biogenic process, gas hydrate stable in high pressure and low temperature condition, actually gas hydrate can form in polar areas and in deep sea environment, but in this research will be focused on deep sea environment, gas hydrate in deep sea form in depth of

	<p>150-2000 m. Gas hydrate that associated with methane will form methane hydrate, this research will discuss about how the process of methane hydrate formation in deep sea environment and the important role of deep sea sediment as the accumulation place of methane hydrate, methane gas usually accumulate in deep sea sediment in find grain material, the concept of this research is interpretation Kerek Formation outcrops, Kerek Formation is formation of rocks that the composition is deep sea rocks, from learn Kerek Formation outcrops it can give description about the past process in deep sea before the material come into rocks and uplift as outcrops in surface, the description of the past process in deep sea include sedimentation process, this concept suitable with one of principal of sedimentology that is "The present is the key to the past". Metodology of this research is geology fieldwork and lab analysis, from geology fieldwork will get data of measuring stratigraphy in Kerrek Formation, and the data like sample of material sediment and data of measuring stratigraphy will be analyzed in lab. The result of this research will give new idea and new concept that can be used in methane hydrate exploration.</p> <p>Key Words : Biogenic Methane Hydrate, Deep Sea Sediment, Kerek Formation, Central Java, Indonesia</p>
 <p>Sanjaykumar B. Gajera GIC1571060</p>	<p>IrIII complexes as potential modulators of biological response: an overlooked topic in medicinal inorganic chemistry</p> <p>Sanjaykumar B. Gajera and Mohan N. Patel* Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar-388 120, Gujarat, India. jeenen@gmail.com</p> <p>ABSTRACT</p> <p>Dihalobridged binuclear complex $[(h5-C5Me5)Ir(m-Cl)Cl]_2$ undergo halide bridge cleavage reaction with bidentate N, N heterocycles namely bipyrazole/pyrimidine 2-amine/triazolo fused pyrimidine derivatives forming a new half sandwich cationic mononuclear organoiridium(III) complex $[(h5-C5Me5)Ir(k2-L)Cl]Cl$ (Ir1-6). Their identities have been established by satisfactory physicochemical techniques, namely, elemental analyses, spectral (ESI-MS, IR, NMR (1H, ^{13}C), UV/vis), electrochemical studies (cyclic voltammetry (CV) and differential pulse voltammetry (DPV)). The in vitro antibacterial activity against three Gram(-ve) and two Gram (+ve) microorganisms have been studied for all compounds and exhibit good inhibition as compared to ligands. In addition, all compounds exhibit significant cytotoxicity toward brine shrimp and LD50 value obtained in the range of 7–12 mg mL⁻¹. Cellular level cytotoxicity have been performed using bioassay of <i>S. pombe</i> and shows inevitable viability as concentration increases, it has also been supported by DNA cleavage experiment. Notably, The UV absorption spectral titrations of the synthesized complexes with DNA reveal that the complexes bind to CT-DNA through intercalation mode($K_b = 105$), it has also been supported by molecular docking. Cyclic voltammetry studies of the complexes indicates irreversible oxidation and reduction potentials. The results suggested that complexes show promising binding affinity than all the ligands towards CT-DNA.</p>

Mehulkumar L. Savaliya
GIC1571061

**An understanding towards sustainable production of biodiesel through
catalytic transesterification**

Mehulkumar L. Savaliya, Bhartkumar Z. Dholakiya*
**Department of Applied Chemistry, S.V. National Institute of
Technology, Ichchhanath, Surat-395007, Gujarat, India**
bharat281173@gmail.com

ABSTRACT

In the present work, a potential hen egg shell based solid alkali catalyst was successfully prepared by calcination of hen egg shell powder and applied to the transesterification of Helianthus annuus L oil regarding production of biodiesel. The highest biodiesel (%) yield was observed up to 98.59 %. Synthesized catalyst revealed promising catalytic activity for transesterification of Helianthus annuus L oil with 2.5 % catalyst dose (w/w). The egg shell derived catalyst (ESDC) was duly characterized by FT-IR, XRD, BET, TPD-CO₂, TGA and SEM analysis. From the experimental results, it has been evidenced that, the optimum reaction condition within the selected parameters were found to be, reaction temperature is 65 °C, reaction time is 2 h, catalyst loading is 2.5% (w/w) and oil to methanol ratio is 1:7, obtaining maximum biodiesel production.

<p>Ga-Eul Lee GIC1571062</p>	<p>Electrochemical properties of carbon coated SiO anode material for lithium-ion batteries</p> <p>Ga-Eul Lee, Byung-Ki Na* Department of Chemical Engineering, Chungbuk University, Chungdae-ro 1, Seowon-gu, Cheongju-si, Chungcheongbuk-do, Republic of Korea nabk@chungbuk.ac.kr</p> <p>ABSTRACT</p> <p>Lithium-ion batteries are being utilized in various IT fields such as smart phones, lap top computers and electric vehicles. So, necessity of secondary batteries with high capacity will be increased in the near future.</p> <p>Si-based materials are usually used for anode in lithium-ion batteries. In particular, Si has the high theoretical capacities of 4200mAh/g, and it is one of the most promising anode materials in a lithium-ion battery field. However, Si shows large volume expansion during charging and discharging, so it shows rapid capacity fading. As compared SiO with Si, SiO has less volume expansion than Si. But it still has problems of rapid capacity fading and low electrical conductivity.</p> <p>In this study, sucrose as carbon source was used to improve the electrical conductivity and reduce volume expansion. SiO/C composite was made from a simple synthesis. Sucrose solution was mixed SiO and dried at 100°C. The obtained solid was heated in a tube furnace at 700°C for 3h under Ar atmosphere. Moreover, carbon nanotube(CNT) was added to carbon source to increase the electrical conductivity.</p> <p>XRD, TEM and SEM were confirmed to elements of the composites and structural characteristics. Half-cell was assembled to show the cycle performance during charge and discharge. The SiO/C showed a stable specific capacity of approximately 600mAh/g over 50 cycles.</p> <p>Keyword: lithium-ion battery, SiO, sucrose coating, anode</p>
 <p>Min Zy Jung GIC1571063</p>	<p>Synthesis and Electrochemical Characteristics of Hollow Silicon/Carbon Composite Anode for Lithium ion Battery</p> <p>Min Zy Jung, Jong Dae Lee Chungbuk National University jdlee@cbnu.ac.kr</p> <p>ABSTRACT</p> <p>In recent years, lithium ion battery has been widely used on portable electronic devices and electric/hybrid vehicles because of its high energy density and cycling stability. As an anode material for the lithium ion battery, Silicon(Si) is getting attention for its high theoretical specific capacity (about 4200mAh/g) and its proper potential range for lithium insertion and extraction. However, Si has properties that could be obstacles for its practical use as the lithium ion battery anode. Si not only has low intrinsic electric conductivity but also undergoes severe volume changes during the lithium ion insertion/extraction process which results</p>

	<p>the synthesis of Hollow SiO₂, magnesiothermic reduction of SiO₂ to obtain hollow Silicon, carbonization of phenolic resin. The prepared hollow Silicon/Carbon composites were analysed by BET, XRD, FE-SEM and TGA. Also the electrochemical performances of hollow Silicon/Carbon composites as the anode electrode were investigated by constant current charge/discharge cycle test, cyclic voltammetry and impedance tests in the electrolyte of LiPF₆ dissolved in organic solvents(EC-DMC). It was found that hollow Silicon/Carbon composite electrode showed the improved cycling performance and electric conductivity.</p> <p>Keyword: Lithium ion batteries, Silicon, Hollow SiO₂, Carbon, Magnesiothermic reduction</p>
 <p style="text-align: center;">Debabrata Bhadra GIC1571064</p>	<p style="text-align: center;">Low Voltage and High Field-Effect Mobility Thin Film Transistor Using Crystalline CuO/PVDF nanocomposite as Gate Dielectric</p> <p style="text-align: center;">Debabrata Bhadra Department of Physics, Bhairab Ganguly College, Kolkata-56, India</p> <p style="text-align: center;">Department of Solid State Physics, Indian Association for the Cultivation of Science, Kolkata-32, India bhadra.debabrata@gmail.com</p> <p style="text-align: center;">ABSTRACT</p> <p>Operation of organic thin film transistors (OFETs) with low voltage is currently a prevailing issue. We have fabricated anthracene thin-film transistor (TFT) with an ultrathin layer (~450nm) of Poly-vinylidene fluoride (PVDF)/CuO nanocomposites as a gate insulator. We obtained a device with excellent electrical characteristics at low operating voltages (<1V). Different layers of the film were also prepared to achieve the best optimization of ideal gate insulator with various static dielectric constant (ϵ_r). Capacitance density, leakage current at 1V gate voltage and electrical characteristics of OFETs with a single and multi layer films were investigated. This device was found to have highest field effect mobility of 2.27 cm²/Vs, a threshold voltage of 0.34V, an exceptionally low sub threshold slope of 380 mV/decade and an on/off ratio of 106. Such favorable combination of properties means that these OFETs can be utilized successfully as voltages below 1V. A very simple fabrication process has been used along with step wise poling process for enhancing the pyroelectric effects on the device performance. The output characteristic of OFET after poling were changed and exhibited linear current-voltage relationship showing the evidence of large polarization. The temperature dependent response of the device was also investigated. The stable performance of the OFET after poling operation makes it reliable in temperature sensor applications. Such High-ϵ CuO/PVDF gate dielectric appears to be highly promising candidates for organic non-volatile memory and sensor field-effect transistors (FETs).</p> <p>Keywords: Organic Field Effect Transistors, gate dielectric, thin film transistor, Organic semiconductor</p>
<p style="text-align: center;">Jignesh K. Patel GIC1571065</p>	<p style="text-align: center;">Taguchi Design Optimization of machining process parameters on Depth of cut on AWJ for Banana Fibre Reinforced Composite</p> <p style="text-align: center;">Jignesh K. Patel Department of Mechanical Engineering,</p>

	<p>S.V. National Institute of Technology, Ichchhanath, Surat-395007, Gujarat, India. jigspatel225@hotmail.com</p> <p>Abdulhafiz A. Shaikh* Department of Mechanical Engineering, S.V. National Institute of Technology, Ichchhanath, Surat-395007, Gujarat, India. aas@med.svnit.ac.in</p> <p>ABSTRACT</p> <p>In this paper illustration of the influence of AWJ machining process parameters on depth of cut are determined and optimization of process parameters is done by Signal to noise (S/N) ratio. Experiments are conducted on banana fibre reinforced composite material. A L9 orthogonal array and analysis of variance (ANOVA) are applied to study the performance characteristics of machining parameters, mainly (hydraulic pressure, traverse speed and standoff distance) with consideration of depth of cut. Results obtained by Taguchi method and signal to noise (S/N) ratio match closely with (ANOVA) and it is found that hydraulic pressure is most influencing input parameter for depth of cut. It is observed that depth of cut increased by increasing the hydraulic pressure. It is also observed that traverse speed and standoff distance are significant parameters for output response. It is felt that increase in traverse speed and standoff distance leads to decrease in depth of cut.</p> <p>Keywords- Banana fibre reinforced composite; water jet machine; Taguchi method; analysis of variance; optimization</p>
<p>Se-Jin Kim GIC1571066</p>	<p>Electrochemical characteristics of Poly Silicon/C for anode material of lithium-ion batteries</p> <p>Se-Jin Kim, Byung-Ki Na* Department of Chemical Engineering, Chungbuk National University Chungdeae-ro 1, Seowon-gu, Cheongju-si, Chungcheongbuk-do, Republic of Korea nabk@chungbuk.ac.kr</p> <p>ABSTRACT</p> <p>Lithium-ion batteries are attractive energy storage devices with high energy density, capacity and cycle performance. Graphite-based anode materials are used in commercial lithium-ion batteries for portable electronics. However, the theoretical capacity of graphite is limited to 372mAh/g. So, we should find alternative anode materials with higher specific capacity and better cycle performance.</p> <p>Silicon is one of the most promising anode materials because of its high theoretical capacity of 4200mAh/g. However, the main problem is the huge volume change (>300%) during alloying/dealloying process.</p> <p>In this study, sucrose as carbon precursor was used as a buffering material for volume expansion. Sucrose was dissolved in deionized water with continuous stirring. Then, Poly Silicon was added in the sucrose solution and the solution was dried under stirring to get solid blend at 100°C. The as-prepared precursor was</p>

	<p>heated at 700°C for 3 h under argon atmosphere in a tube furnace. The structure and electrochemical characteristics of the composites were analyzed by means of X-ray diffraction (XRD), scanning electron microscopy (SEM), thermogravimetric analysis (TGA) and electrochemical measurements.</p> <p>Keyword: Lithium-ion battery; Poly Silicon; Sucrose; Anode material</p>
<p>Suvankar Barai GIC1571067</p>	<p style="text-align: center;">Path Following and Route Selection of Autonomous Mobile Robot using Passive RFID Tags</p> <p style="text-align: center;">Suvankar Barai, Buddhadeb Sau Department of Mathematics Jadavpur University Kolkata- 700 032, India sbarai@research.jdvu.ac.in</p> <p style="text-align: center;">ABSTRACT</p> <p>The path following mobile robot based on 'paint-line-detection' have been rapidly implemented among lots of countries. In this paper, we propose a passive RFID-based path following and route selection methods for an autonomous mobile robot to reach source to predefined destination. The method is based on Received Signal Strength Indicator (RSSI) technique. An RFID reader is installed under the mobile robot which moves through a path. The path is build using low-cost passive RFID tags by plotting them serially on the ground. The RFID reader read the tags which falls in its recognition area then calculate the distance of the tag using RSSI technique and find the direction using Direction Of Arrival (DOA) method. Then robot moves towards the up or down (direction) nearest tag using our method and continue this process serially one by one till it reach the destination. The main goal of our works is to develop a mobile robot with the capability of navigating through a predefined path or towards a set destination using a RFID tags as a point of reference.</p> <p>Let, current tag's co-ordinate is (x_n, y_n) and the next tag's co-ordinate is (x_{n+1}, y_{n+1}) and the distance between two tags is d_n, the radius of sensing area is r then,</p> $d_n = (x_n, y_n) - (x_{n+1}, y_{n+1}) $ $r > d_n$ <p>In paint line based path following mobile robot, there are lots of drawback that system such as if there are multiple line cross over and also if the draw line is erase by water or raindrop the robot will failed to do it's task. But in our system robot will follow the particular line which is order to follow when there are multiple lines. Also as the path is build using RFID tags there are no issue of erase the path by water or rain drops. Another thing is that our method is can be done even in dark as there is no need of light.</p> <p>Selection of route is one of important issue to reach the destination. To select the right path we define the destination information in the passive tags at the place where the path is divide. In each place of path fork we write a special kind of information on passive tags, so mobile robot can choose the destination path accordingly.</p> <p>Keywords- Path Following, RFID Reader, RFID Tags, Route Selection</p>



Dipo Aldila
GIC1571069

Deterministic Mathematical Model Approach to Understand the Spread of Extreme Ideology With Contra-Productive Intervention

D. Aldila¹, K.A. Sugeng

Department of Mathematics, University of Indonesia, Depok 16424, Indonesia

1aldiladipo@sci.ui.ac.id

ABSTRACT

Deterministic mathematical model and numerical simulation to explain the spread of extreme ideology in a closed society will be discussed in this article. Human population were divided in to Virgin sub-population $S(t)$, Semi fanatic sub-population $E(t)$, Fanatic sub-population $F(t)$, Aware sub-population $A(t)$, Prisoned sub-population $P(t)$ and also Recovered sub-population $R(t)$. Intervention from government to educate people about dangerous of extreme ideology will be included in to the model among with intervention to send fanatic individual to prison. This last intervention will give a contra-productive effect which will enlarge intensity of fanatic population to persuade other population to follow their ideology. Mathematical analysis for model equilibrium points and their local stability criteria will be discussed. Some scenario that might appears in reality will be shown to give a better illustration about the model.

Keywords : Deterministic mathematical model, numerical simulation, extreme ideology.



Asmae Berrada
GIC1571070

Technical and Economic Studies of Gravity Storage

Asmae Berrada

School of Science and Engineering, Al Akhawayn University

ABSTRACT

Energy storage plays a key role in providing more flexibility and balancing to the electric grid. With the increasing penetration of renewable energy technologies, there is a need to instantaneously match demand with supply. Energy storage has the potential to provide a back-up to intermittent renewable energy by storing electricity for use during more valuable periods. At this time, there are limited storage options because several technologies are at very early stage of development. Pumped hydro energy storage is currently the most widely installed technology. This form of storage has some drawbacks which include the technology siting as it cannot be implemented everywhere. This paper presents a new concept that is similar to the exciting pumped hydro storage technology. This concept is known as gravity storage as it stores electricity in the form of gravitational potential energy. This storage option provides better operating characteristics and economically sounds solution over conventional pumped hydro storage, and can be placed almost anywhere electricity storage is needed. This paper proposes a methodology to optimally size the gravity storage technology. It also presents an economic analysis to investigate the value of this storage option. This work identifies the leveled cost of gravity storage and compares it to similar storage options.

Keywords—Energy Storage; Gravity; LCOE; Economic Analysis; Optimal Sizing.

Dr. Jaya Gupta
GIC1571071

Analysis and Estimation of Lomax-Weibull distribution

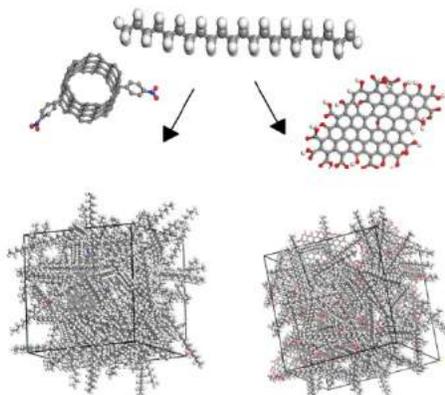
Jaya Gupta

	<p style="text-align: center;">Department of Mathematics, JK Lakshmipat University, Jaipur-302026, Rajasthan, India. drjayagupta08@gmail.com</p> <p style="text-align: center;">Mridula Gargb Department of Mathematics, University of Rajasthan, Jaipur - 302004, Rajasthan, India. gargmridula@gmail.com</p> <p style="text-align: center;">ABSTRACT</p> <p>In this paper, we analyze the properties of Lomax-Weibull distribution defined by the author. We derive expressions for the characteristic function, moments, hazard rate function, entropy and reliability function. We plot some graphs for its probability density function (pdf), hazard rate function, variance, skewness and kurtosis to analyze the effect of different parameters using the software ‘Mathematica’. We also discuss estimation of different parameters by the method of maximum-likelihood.</p> <p>Keywords: Lomax-Weibull distribution, hazard rate function, Rényi entropy, estimation, reliability.</p> <p>MSC Subject Classification: 60E.</p>
<p>Mojir Jalilian GIC1571072</p>	<p style="text-align: center;">Shoushtar new town : a sample of sustainability in Iranian contemporary architecture</p> <p style="text-align: center;">Mojir Jalilian Department of architecture ,Shoushtar branch, Islamic Azad university, Shoushtar, Iran . mojirj@gmail.com</p> <p style="text-align: center;">ABSTRACT</p> <p>Sustainable architecture could be defined as the creation of buildings for which only renewable resources are consumed throughout the process of design, construction and operation . there are different aspects which could be considerable in sustainability such as environmental , social and ... factors . It could be said that the first traceable concepts of sustainability in Iranian contemporary architecture are visible in some buildings in 1960’s , whereas a couple of young architects would try to find solutions for climatic and social issues and moving toward a sustainable architecture. (Iran is one of the unique countries which have the widest variety of climates and ethnic groups , hence architectural solutions differ from one region to another in this country).</p> <p>In this paper, the architecture of Shoushtar new town, which is an example of avant-garde contemporary architecture in Iran, is studied according to its caring about climatic and social factors and the amount of success it has had in creating sustainable architecture . the research is qualitative which examines indepth analysis on the case study (Shoushtar new town) to better understand different aspects of the architecture .</p> <p>IndexTerms—Sustainable architecture, Shoushtar New town , Social sustainability</p>
<p>Monisha Rastogi GIC1571073</p>	<p style="text-align: center;">Classical molecular dynamics scheme for modeling and predicting the phase transition behavior in phase change materials impregnated with carbon nanoadditives</p>

Monisha Rastogi
School of Engineering, Indian Institute of Technology Mandi, Himachal Pradesh 175001, India

Rahul Vaish
Materials Research Centre, Indian Institute of Science, Bangalore 560 012, India

ABSTRACT



The present study deals with modeling and predicting the dispersion, diffusion and phase transition behavior of n-tetracosane impregnated with various carbon nanoadditives. Owing to the various desirable attributes mainly high latent heat capacity and a sharp phase transition temperature, such phase change materials have gained momentum as efficient latent heat storage systems in low to medium temperature range applications. Classical molecular dynamics simulation techniques have been employed to evaluate the mass, thermal and transport property of the considered paraffin based PCMs. This assisted in elucidating the factors which are responsible for modification or enhancement of the characteristics of PCMs from atomic point of view. In the same regards, bulk disordered atomistic models of tetracosane reinforced with various carbon nano-fillers have been generated in the realistic equilibrium conformations and are subjected to rigorous multiple equilibration procedures. COMPASS forcefield in conjugation with periodic boundary conditions has been implemented in all the simulation techniques. Employing both canonical and constant-temperature, constant- pressure ensembles assisted in affirming the implemented approach. It was deduced that examining the kinetic, potential, non-bond and total energy of the considered composites aided in elucidation of their modified or ameliorated properties. Further, self-diffusion coefficient and mean square displacement reflected the atomic strength and mobility of the considered latent heat storage system. Radial distribution function which is indicative of the density variation as a function of temperature has also been evaluated to support the deductions. The results hint at unexplored potential of the propounded classical molecular dynamics based methodology which could serve as predecessor and support tool to the experimental investigations.

Anupam Krishnan
GIC1571074

VALIDATION OF K- ω SST TURBULENCE MODEL FOR ANALYSIS OF A SMALL SCALE WIND TURBINE

Anupam Krishnan, Dr. M Premalatha, Ramakant Pandey
Computational Fluid Dynamics Laboratory, Department of Energy and Environment, National Institute of Technology, Tiruchirapalli, 620015, India

ABSTRACT

Design of a small scale wind turbine using the Blade Element Momentum (BEM) theory and validation of SSTK- ω turbulence model for flow analysis are the two goals of this paper. The wind turbine is designed to operate at a rated wind speed of 5m/s and a tip speed ratio of 6. A three dimensional computational model was created and simulations were carried out using commercial Computational Fluid Dynamics (CFD) code ANSYS FLUENT for a range of undisturbed wind velocities from 4 to 10 m/s. The thrust values predicted by the model are not in good agreement with the experimental values so the change in kinetic energy upstream and downstream of the turbine is analysed to find out the power output at different wind speeds. The results are validated using the theoretical values obtained by the BEM method. The proposed wind turbine model produces a power of 2.51 Watts at a wind speed of 10 m/s.

Keywords: small scale wind turbines, blade element momentum theory, CFD, k- ω SST model.



Miriam Varsha Issac
GIC1571075

Characterisation Of Pebax3533|SiO2 Polymer Films

Miriam Varsha Issac, Dr. Lity Alen Varghese, Nikhita Mariyam Abraham, Rose Maria Tom, Mohammed N. Shamil.
Department of Chemical Engineering, National Institute of Technology, Calicut

ABSTRACT

The present work aims to prepare Pebax 3533|SiO₂ nano particle membrane in various weight concentrations by the method of solvent casting and to evaluate their thermal, mechanical and chemical properties. Simulative studies show that nanosilica loading improves the diffusion coefficients for CO₂ and CH₄ gases in Pebax 3533. For this reason, we chose Pebax 3533 and SiO₂ nanoparticles for our characteristic study so that their studies could reveal their gas transport behavior. Solution casting and solvent evaporation techniques were employed for casting of polymeric membranes. The polymer was dissolved in n-butanol to a concentration of 4 wt. % at a heating of 70 °C on reflex and magnetically stirring for around 1 hour to obtain very good polymer solution. SiO₂ nanoparticles were then added, stirring was continued for 1 hour. To obtain a stable suspension, the mixture was then kept in an ultrasonication bath for 2 hours. Then it is poured into Teflon trays for casting. The films thus obtained were found to have thickness around 200 μ m and were observed to have pale appearance and smooth surface. SiO₂ nano particles were added in various weight percentages of 1%, 3%, 5% and 7%. It was observed that the addition of nanoparticles make the films more tough and white in color. The films were then subjected to various characterization tests like UTM, SEM, TGA, DSC, FTIR, and XRD. The morphology of the films was obtained from the SEM images whereas the mechanical properties were given by UTM. A TGA and DSC result deals with thermal properties of the polymeric films. The physical properties were confirmed by the XRD results and the chemical composition by FTIR. All the obtained results of the raw polymeric films as well

	<p>as the composite films were compared and the optimum filler concentration was found. From the characterization tests, 5% is concluded to be the optimum nano filler concentration with the best properties.</p> <p>Keywords: Pebax 3533, Nano silica, Gas transport properties.</p>
 <p>Muhammad Maulana Malikul Ikram GIC1571076</p>	<p>The Effect Of Photoperiodisation With Led Light On Productivity Of Female Flower In Cucumber (Cucumis Sativus L.)</p> <p>Muhammad Maulana Malikul Ikram, Rizkita Rachmi Esyanti*, Ahmad Faizal School of Life Sciences and Technology, Institut Teknologi Bandung, West Java, Indonesia malikul.ikram@gmail.com rizkita@sith.itb.ac.id</p> <p>ABSTRACT</p> <p>Cucumber productivity can be optimize by regulating their photoperiod. Photoperiod will affect the production of female flower, the basis of cucumber fruit. In this research, two cucumber cultivars (Mercy and KE 27187) was given with photoperiod treatment, 8, 12, and 16 hours of light with 34 red, 4 blue, and 4 yellow LED. 12 hours treatment increased sugar accumulation (7482, 69 ppm) that didn't differ with 16 hours treatment. High accumulation of sugar inducing ethylene respons until 27,69% (v/v). Meanwhile, 16 hours treatment in KE 27187 cultivar gives highest sugar accumulation (9178,59 ppm) and ethylene production (21,92% (v/v)). High sugar accumulation and ethylene production will increase the production of female flower. 16 hours treatment resulting the highest growth rate, with 2-4 times higher than 8 and 12 photoperiods, and biomass dry weight, with 2-6 times higher than other treatments. This results valid for both cultivars, Mercy and KE 27187. From this results, we predicted that Mercy are short-day plants and KE 27187 are long-day plants.</p> <p>Keywords : Cucumis sativus, Ethylene, Female flowers, LED, Photoperiodisation.</p>
 <p>Ambresh P Ambalgi GIC1571077</p>	<p>Experimental Study on Multiband Arrow Shape Patch Antenna with Inverted V-Slot</p> <p>Ambresh P. A *Department of Electronics, Mangalore University, Mangalore-574199, Karnataka (INDIA).</p> <p>Sujata A. A Godutai Engineering College for Women, Gulbarga.</p> <p>P M Hadalgi, P.V.Hunagund Department of Applied Electronics, Gulbarga University, Gulbarga-585106.Karnataka (INDIA).</p> <p>ABSTRACT</p> <p>A multiband arrow shape patch antenna with inverted V slot (MASPAIVS) is designed and proposed for 3.5 GHz frequency. The antenna is designed with novel inverted wide V-slot and arrow shape patch is fed with a microstripline feed method. The wide inverted V-slot make the antenna to have multiple resonances to</p>

	<p>operate in the frequency bands of 1 GHz to 13 GHz achieving a maximum impedance bandwidth of 37.38 % in the satellite applications operating band. The antenna shows good return loss characteristics and operates in the L, S, C-Band and military X-band making it suitable for Wi-Max, WLAN and Satellite applications.</p> <p>Keywords Wireless, Satellite, Frequency, Bandwidth, Military.</p>
 <p>Muhammad Fahri Riadi GIC1571078</p>	<p>The effect of LED light on productivity of Female Flowers in Cucumber (Cucumis sativus L.)</p> <p>Muhammad Fahri Riadi (11211029) Dr. Rizkita Rachmi Esyanti Dr. Ahmad Faizal Bioengineering Departement, School of Life Science and Technology, Institut Teknologi Bandung</p> <p>ABSTRACT</p> <p>Light quality is one of the main factors that affect the productivity of cucumber plants, especially in induction of flowers. In this study, two cultivars of cucumber (Mercy and KE 27187) were treated with red (R), blue (B) and yellow (Y) light provided by LED (light emitting diode) with different compositions; RB (80:20) and RBY (80:10:10) for 8 h. Control plants were incubated under HPS lamps and TLD. The results showed that treatment of RB8 generate higher biomass and growth rate compared with MBK in both cucumber cultivars. Interestingly, RBY light increased sucrose content in plants, which positively correlate to the number of their female flowers. However, the energy efficiency of plants treated under LED light remains a major obstacle compared with control plants. Therefore, further research using appropriate PAR and light intensity of LEDs is needed to increase the productivity of female flowers in cucumbers.</p> <p>Keywords : cucumber, female flowers, LED, sucrose</p>
 <p>Feby Mayorazaki GIC1571079</p>	<p>Enhancement Of Photosynthetic Rate Through Photoperiod Using Led In Cucumber (Cucumis Sativus L.)</p> <p>Feby Mayorazaki, Dr. Rizkita Rachmi Esyanti, Dr. Ahmad Faizal School of Life Sciences and Technology Institut Teknologi Bandung Bandung, Indonesia feby.mayora@gmail.com</p> <p>ABSTRACT</p> <p>Previous studies demonstrated that photosynthetic rate in plants could be enhanced by manipulating their photoperiods. Therefore the aim of this study was to investigate the effect of day length using combination of red (R), blue (B) and yellow (Y) light provided by LED (light-emitting diode) on photosynthetic rate of cucumbers. Two cucumber cultivars (Mercy and KE-27187) were incubated under 8 h, 12 h, and 16 h photoperiod using a composition of RBY-LED light (80:10:10) and HPS + TLD lamps (as a control) inside growth chambers for 28 days. We obtained that 16 h photoperiod resulted in the best quality of plants, in terms of growth rate, sugar content, chlorophyll content, and mass balance among the treatments. However, LED-incubated plants consumed energy less efficiently compared to control plants. This indicates that precise LED specifications should</p>

	<p>be re-adjusted to maximize energy efficiency for plant production. Keywords: cucumber, growth, LED, photoperiod, photosynthetic growth</p>
	<p>Lean Co-Creation Analysis in Manufacturing Industries</p> <p>Ashish Shrivastava, Mohit kumar, Jitendra Achara, Ramdhan Maheshwari, Ramdhan Sodani, Aviral Kothari Mechanical Engineering Department</p> <p>ABSTRACT</p> <p>The objective of this paper was to provide a clear relation between lean and Co-creation by using concepts of lean & to demonstrate how lean concepts can be used with co-creation in industries. By secondary data relations between the categories (lean, Co-creation, and industry) was made where a conceptual model of 'Lean Co-creation' was provided. The concept was further supplemented by interviews.</p> <p>From the conducted interviews design aspects was highly crucial for industry, supplier and customers. Technical, Social and Economic impact of activities within industry is being questioned which makes room for being able to use parts of conceptual model as a framework of mapping activities. The conclusions for this research are that parts of the conceptual model can be used as a framework. It is however of further investigation of its practical application since co-creation with lean in industry are highly useful at organizational level.</p> <p>Keywords: Lean,Co-creation,wastage.</p>
<p>Shaymaa AL- Rubaye GIC1571081</p>	<p>Synthesis and electrochemical performance evaluation of MnCo2O4 nanoflakes/graphene nanoplatelets material for supercapacitor applications</p> <p>Shaymaa Al- Rubaye, Ranjusha Rajagopalan, Zheyin Yu, Shi Xue Dou and Zhenxiang Cheng* Institute for Superconducting and Electronic Materials, University of Wollongong, Wollongong, NSW 2522, Australia cheng@uow.edu.au</p> <p>ABSTRACT</p> <p>The present work, report the synthesis and characterization of MnCo2O4 nanoflakes/ graphene nanoplatelets for high performance supercapacitors electrode application. MnCO2O4 nanoflakes were synthesized successfully via hydrothermal technique. The flaky MnCo2O4 along with the graphene nanoplatelets showed superior performance in terms of specific capacitance, electrical conductivity and cycling stability as compared to the pristine MnCo2O4 systems. A high specific capacitance of ~ 1323 F g-1 was observed at 10 mVs-1scan rate. 100% specific capacitance retention was observed even at the end of 10000 cycles at a current density of 7.81A g-1.</p>



Aziz Ibrahim Abdulla
GIC1571082

Mechanical Properties of Sand modified Resins Used for Bonding CFRP to Concrete Substrates

Aziz Ibrahim Abdulla
Civil Eng. Dept., Al-Ahliyya Amman University
aziz_914@hotmail.com

Hashim Abdul Razak
Eng. Dept., Malaya University
hashim.abdulrazak@gmail.com

Muataz I. Ali
Civil Eng. Dept., Tikrit University
muitaz988@yahoo.com

ABSTRACT

This study investigates the properties of adhesive before and after mixing with fine-sand, and its behavior on reinforced concrete beams strengthened by CFRP to show the effects of modified epoxy adhesive on load-carrying capacity, ductility, stiffness and failure mode of the reinforced concrete beams. Compressive strength, flexural strength and the effect of high temperature on these properties were the focus of the study in order to prove the efficiency of adding fine sand to improve adhesive properties and reduce cost. Based on the compressive and flexural tests, results indicated that the addition of sand to the adhesive improved its mechanical properties when sand is 50% of the total weight of the adhesive. However, its effect on the modulus of elasticity is minimal. Using adhesive with fine sand increased the ultimate load bearing capacity, ductility, stiffness and toughness of the reinforced concrete beams strengthened by CFRP. The study also revealed that the best ratio of fine-sand to adhesive in terms of cost reduction, maintaining workability, and enhancing the mechanical properties is 1. Lastly, the use of fine sand with adhesive ensured a significant reduction in the cost of the adhesive and increased the adhesive resistance to temperature.

Keywords CFRP, Concrete, Resin composite cements, Sand, Thermal analysis.

Gulnoz Yusupkhodjaeva
GIC1571083

Researches Of Methods Improvement The Properties Of Mixed Threads From Natural Fibers

Yusupkhodjaeva G.A.
Tashkent Institute of Textile and Light Industry

ABSTRACT

The results of the study on the development of the technological parameters of preparation of blended yarns of cotton fibers and the secondary waste silk. Presents physical-mechanical and technological characteristics of blended yarns, and provides figures obtained woven fabric.

Keywords: fiber, waste, mixed yarn, cloth, the cotton silk yarn, cotton.



Abisatya Pambayun WS
GIC1571095

Hydrodynamic Analysis of Compost Soil Mixture and its Implication on Growth and Potassium Uptake in Corns (*Zea mays* L.)

Abisatya Pambayun WS
Department of Bioengineering, School of Life Sciences and Technology,
Bandung Institute of Technology, Indonesia

ABSTRACT

The research has been conducted on the hydrodynamics analysis of compost soil mixture and its implications for growth and potassium uptake in corns. The study design arranged in a completely randomized method with six repetitions for soil treatment (T0), a mixture of soil:compost 3:1 (T1), and a mixture of soil:compost 1:1 (T2) also treatment without nutrients (N0), NPK with 200 kg/ha concentration (N1), and NPK with 400 kg/ha concentration. (N2). The research method was conducted on the porosity, capillarity and water holding test. The results showed soil:compost mix of 1:1 has a porosity value of 0.66 ± 0.01 (11% greater than the porosity of the soil) and water holding value of 64.79 ± 1.99 (18% greater than water holding of the soil). Corn plants grown in soil:compost mix of 1:1 has grown 35% higher than the planting of corn in soil and biomass gain of 125%. Potassium uptake in corn plants grown in compost soil mix 1:1 are 5% higher than the potassium uptake of corn plants grown in soil. This can be concluded that giving compost to the soil can improve the structure of soil and the flow of water from the soil to the plant as well as the implications for the growth and potassium uptake in plants.

Keywords: hydrodynamics, soil, compost, corn, growth, uptake of potassium

Abul Quasem Al Amin
GIC1571096

Climate change mitigation: comparative assessment between Malaysia and ASEAN economy

Abul Quasem Al-Amina, Rajah Rasiah , and Adeel Ahmed
Interntional Business School (IBS), Universiti Teknologi Malaysia
amin.cantt@gmail.com

ABSTRACT

This study examines empirically comparative assessment between Malaysia and ASEAN economy for climate change related vulnerability impacts, and remedial options as an optimal and applicable strategy by prioritizing needs in climate change mitigation over 100 years. An empirical downscaling dynamic integrated model is constructed with a dual multidisciplinary framework combining economic, earth science and ecological concepts to analyse a long-run assessment. The dual model takes account of various climatic variables, including carbon cycle, carbon emission, climatic damage, carbon control, carbon concentration, and temperature, which was adapted from observational records of climatic changes caused by global warming from 2010 to 2110. The results indicate that without optimal climate policy and action the cumulative cost of climatic damage over the period 2010-2110 would be MYR40,128 and MYR151,013 billion under the present climatic regime in Malaysia and ASEAN respectably. Whereas under the optimal policy, the cumulative cost of climatic damage would fall to MYR5,264 billion over 100 years in Malaysia alone. The findings of the comparative assessment intensify what action should be taken for the climate change mitigation in ASEAN region in future to slow down carbon emission, and

	<p>climatic damage, and particularly sustainable development over coming years in the region.</p> <p>Keywords: Climate Change; Carbon Emission Projections; Mitigation Policy; ASEAN</p>
 <p>Richy Zulyver Sinaga GIC1571097</p>	<p style="text-align: center;">Application of Mechanization Cultivation of Sugarcane On Soil Tillage</p> <p style="text-align: center;">Richy Zulyver Sinaga Department of Mechanical and Biosystem Engineering IPB</p> <p style="text-align: center;">ABSTRACT</p> <p>National sugar industry holds an important role to meet the growing demand for sugar. Along with economic growth and technological progress, Indonesia is one of the rich country of human resources, plants, and as agrarian country have very lush land. Land of Indonesia have good potention that every plants can grow. Sugarcane is grown often face difficulties, especially on soil properties, soil texture, and soil conditions. One of the effort can to solving the problem is soil tillage. Application of mechanization can to managing the building of irrigation, drainage, flood, water control system, performing environmental impact assessments, and agricultural product processing. Soil tillage have two parts about primary tillage and secondary tillge that have some function to change soil texture, soil properties, and soil condition so that sugarcane can grow well. There are four kinds of soil tillage that using full mechanization for tractor and implement used, they are : Plowing I ,Plowing II , Harrowing, Furrowing. The objectives of the field practice were to make land suitability map for sugarcaneplant (<i>Saccharum officinarum</i>), to give recommendation of location including area for sugarcane plant cultivation and to increase sugarcane plant productivity. Parameter measured show that Bigger field efficiency when harrowing activities is 93.24 % and have minimum fuel consumption cost amount of 74585.64 Rp/acre if it compared with other soil tillage. Minimum field efficiency when plowing I activities is 60.22 % and have bigger fuel consumption cost is 232758.6 Rp/acre.</p>
 <p>Younjong Park GIC1571098</p>	<p style="text-align: center;">A novel approach for detection of water leakages in water distribution networks using multi-hop wireless technique</p> <p style="text-align: center;">Youn-Jong Park, Ji-Hun Kang Research Center, SK Engineering and Construction, Seoul, Korea</p> <p style="text-align: center;">ABSTRACT</p> <p>Water leakage in a water pipeline system can lead to a serious safety as well as economic problems but the significant amount of leakage occurs in many water supply systems. The leak detection using sensors is recently used to detect and locate the water leakage. Even though the effectiveness of leak sensors has been studied extensively, there are some limitations on the leak detection method due to its high telecommunication cost. In order to reduce the operational cost, radio frequency (RF) sensors are considered to be satisfactory but they also have some drawbacks such as a relatively short telecommunication distance, which it can cause the increase of installation cost of sensors. In this study, the feasibility of multi-hop wireless method was assessed based on field tests at about 1 km distribution networks with 6 leak sensors to extend the telecommunication distance. From our experiments, it was investigated that the RF leak signals</p>

	<p>among sensors were well telecommunicated with multi-hop method and the results presented in this paper will help leak sensors to cover a wide range of water leakage area cost-effectively in water distribution networks.</p>
 <p>Richy Zulyver Sinaga GIC1571100</p>	<p align="center">Application of Mechanization Cultivation of Sugarcane on Soil Tillage</p> <p align="center">Richy Zulyver Sinaga Department of Mechanical and Biosystem Engineering, Faculty of Agricultural Technology, Bogor Agricultural University</p> <p align="center">ABSTRACT</p> <p>National sugar industry holds an important role to meet the growing demand for sugar. Along with economic growth and technological progress, Indonesia is one of the rich country of human resources, plants, and as agrarian country have very lush land. Land of Indonesia have good potention that every plants can grow. Sugarcane is grown often face difficulties, especially on soil properties, soil texture, and soil conditions. One of the effort can to solving the problem is soil tillage. Application of mechanization can to managing the building of irrigation, drainage, flood, water control system, performing environmental impact assessments, and agricultural product processing. Soil tillage have two parts about primary tillage and secondary tillge that have some function to change soil texture, soil properties, and soil condition so that sugarcane can grow well. There are four kinds of soil tillage that using full mechanization for tractor and implement used, they are : Plowing I ,Plowing II , Harrowing, Furrowing. The objectives of the field practice were to make land suitability map for sugarcaneplant (<i>Saccharum officinarum</i>), to give recommendation of location including area for sugarcane plant cultivation and to increase sugarcane plant productivity. Parameter measured show that Bigger field efficiency when harrowing activities is 93.24 % and have minimum fuel consumption cost amount of 74585.64 Rp/acre if it compared with other soil tillage. Minimum field efficiency when plowing I activities is 60.22 % and have bigger fuel consumption cost is 232758.6 Rp/acre.</p>
 <p>Jatindranath Gain GIC1571104</p>	<p align="center">Fibonacci Series Multiple Quantum Wells: Big Future in Quantum Computation</p> <p align="center">Jatindranath Gain1 Department Of Physics, Derozio Memorial College, Rajarhat Road, Kolkata-700136, India</p> <p align="center">Madhumita DasSarkar Department of Computer Science & Engineering, West Bengal University of Technology</p> <p align="center">Sudakshina Kundu Department of Computer Science & Engineering, West Bengal University of Technology gainelc@gmail.com</p> <p align="center">ABSTRACT</p> <p>Quantum information is stored in states with multiple quasiparticles, which have a topological degeneracy. Topological quantum computation is concerned with two-dimensional many body systems that support excitations. Anyons are elementary</p>

	<p>building block of quantum computations. When anyons tunneling in a double-layer system can transition to an exotic non-Abelian state and produce Fibonacci anyons, which are powerful enough for universal topological quantum computation (TQC). Here the exotic behavior of Fibonacci Superlattice is studied by using analytical transfer matrix methods and hence Fibonacci anyons. This Fibonacci anyons can build a quantum computer which is very emerging and exciting field today's in Nanophotonics and quantum computation.</p> <p>Index Terms-Quantum Computing, Quasicrystals, Multiple Quantum wells (MQWs), Transfer Matrix Method Fibonacci Anyons. Quantum Hall effect</p>
 <p>Humar Kahramanli GIC1571106</p>	<p>Estimation of tractive performance of horticulture tractor tires using Artificial Neural Network</p> <p>Şerafettin Ekinci Department of Mechanical Engineering, Faculty of Technology, Selçuk University, Konya, 42003, Turkey sekinci@selcuk.edu.tr</p> <p>Humar Kahramanlı Department of Computer Engineering, Faculty of Technology, Selçuk University, Konya, 42003, Turkey hkahramanli@selcuk.edu.tr</p> <p>Kazım Çarman Department of Agricultural Machinery, Faculty of Agriculture, Selçuk University, Konya, 42003, Turkey kcarman@selcuk.edu.tr</p> <p>ABSTRACT</p> <p>An Artificial Neural Networks (ANN) is a computational model inspired by biological neural networks. ANNs are successfully used in computer-aided management, system identification, modeling of different physical dynamic processes depending on several fuzzy variables. This paper examines the use of ANN modeling to predict tractive efficiency of drive tire. To acquire sufficient performance data, a new single-wheel tester facility was utilized to investigate the effect of tire size, lug height, tire inflation pressure, and vertical load on tractive performance. To obtain data, experiments were performed on stubble field at two tire types, three different tire lug heights for each tire types, three different axle loads and inflation. Three different models namely Levenberg–Marquardt, Backpropagation and Resilient Backpropagation have been designed. To evaluate the success of systems various statistical measures such as MAE, RMSE and R2 have been used. The results show that the ANN model trained using Levenberg–Marquardt (LM) algorithm produced more accurate results. Modeling applications indicated that ANN is a powerful technique to prognosticate the estimated tractive performance indices as affected by soil-wheel interactions with MAE of 0.0004, RMSE of 0.0202, R2 of 0.9960 for tractive efficiency. The models comprising tested variables were developed with relative high accuracy.</p> <p>Keywords: Artificial neural networks, modeling, tire, traction power, tractive efficiency.</p>

 <p>Jhemson c. Elis GIC1571107</p>	<p>Instructional Game in Teaching Algebra for High School Students: Basis For Instructional Intervention</p> <p>Jhemson c. Elis, maed Division of Batangas City Batangas National High School</p> <p>ABSTRACT</p> <p>Instructional game is a very useful instructional intervention in the teaching and learning process. Basically it is an activity that designed to motivate, engage, and involve learners with the course content enthusiastically. In teaching Mathematics games are the best instructional intervention must be given to the students since it is considered them as their waterloo. It is no surprise that this will help them boost their self – esteem due to its encouraging factor since game is more fun and enjoyable.</p> <p>The study aims to determine the profile of the respondents, performance of the respondents in the pre and posttest, impact of the instructional game used, significant difference between the level of performance of the respondents, and instructional intervention can be proposed.</p> <p>The descriptive method was utilized in this study. Certain approach was used to the main objective of this research. Instructional game was used as instructional intervention in teaching algebra for high school students.</p> <p>There were 30 students served as respondents with equal size of 15 each. Female and male teacher respondents were 7 or 70 percent and 3 or 30 percent respectively.</p> <p>The study recommended that mathematics teachers should conceptualized instructional games for the students with fun and enjoyment while learning through the guide of mathematics education program supervisor so that students must be given time to have fun at the classroom.</p> <p>Key Words: Instructional Game in Algebra, Mathematical Intervention, Joyful, Successful</p>
<p>Fatemeh Ahmadi GIC1571108</p>	<p>A study on the effects of extra dimensions on the galaxy rotation curves in brane-worlds</p> <p>F. Ahmadi and F. Bazhdan Department of Physics, Shahid Rajaei Teacher Training University, Lavizan, Tehran, Iran. Fahmadi@srttu.edu</p> <p>ABSTRACT</p> <p>We study the possibility that the observed flatness of the rotation curves of spiral galaxies is not an evidence for the existence of dark matter haloes. In this paper, we apply the spherically symmetric vacuum (static black hole) solutions of the brane-world theory for explaining galaxy rotation curves without postulating dark matter. We can have a proper potential to explain the galaxy rotation curves without assuming the existence of dark matter.</p>
<p>Rasol Abdullah Mirzaie GIC1571109</p>	<p>Study of type of electrolyte effect on platinum electro-catalyst performance prepared by cyclic voltammetry electrodeposition method for glucose oxidation reaction.</p>

Rasol Abdullah Mirzaie

Fuel cell Research Laboratory, Dep. Of chemistry, Faculty of science, Shahid Rajaei Teacher Training University, Tehran, Iran.
ra.mirzaei@srttu.edu

Behnam Moeini

Fuel cell Research Laboratory, Dep. Of chemistry, Faculty of science, Shahid Rajaei Teacher Training University, Tehran, Iran.
b.moeini@srttu.edu

ABSTRACT

There are several methods to prepare electro-catalysts for low temperature fuel cells. Platinum is used as a common electro-catalyst for this purpose. For preparing effective electro-catalyst platinum is coated on carbon or other substrates. Electrodeposition method is applied for preparing platinum on modified carbon paper as electrode directly. Many parameters affect on performance of prepared electrodes. At this work, the effect of type of electrolyte in electrodeposition solution was investigated for making electro-catalyst that is be used as anode in Glucose Alkaline Air Fuel Cell (GAAFC). Cyclic voltammetry (1.2-0.6) V vs. Ag/AgCl sat. KCl, 100 mV/S) is used as electrodeposition method. Number of CV cycles is varied 10 to 50. Electrodeposition was performed in two precursor solution (0.5 M) containing phosphate and sulfate anions. Platinum concentration in solution was 3 mM. The prepared electro-catalysts were studied for Glucose Oxidation Reaction (GOR) by CV analysis (-0.9 - 0.6 V vs. Ag/AgCl sat. KCl, 20 mV/S) in 0.3 M glucose solution and 0.5 M KOH. Also, Electrochemical Impedance Spectroscopy (EIS) method was used. According our results, the type of anion in electrodeposition solution affects on properties of prepared platinum electro-catalyst for GOR. Optimized condition for number of CV cycles in phosphate and sulfate solutions is 10 and 40 respectively.

Keywords: Platinum electro-catalyst, Cyclic Voltammetry, fuel cell, Glucose oxidation reaction, Electrodeposition method.



Satawat Tanarat
GIC1571110

Effects of Hydraulic Retention Time on Slaughterhouse Wastewater Acidification

Satawat Tanarat and Seni Karnchanawong
Department of Environmental Engineering, Faculty of Engineering, Chiang Mai University, Thailand

ABSTRACT

Many anaerobic treatment systems have been applied for treating various types of wastewater. It has been known to be effective in removing the organic matters with significantly lower cost of operation and excess sludge management. Moreover, the biogas which is formed as final product of the process can be used as energy source for various purposes.

An upflow anaerobic sludge blanket (UASB), especially, has been applied as one of the most effective anaerobic system globally. However, there were some obstacles in the treatment of fat-containing wastewater using UASB reactor. High amount of low-biodegradable matters, as regarded as protein and lipid, in this kind of wastewater are accumulated in the reactor and play as a key role of the process rate limiting, sludge wash-out and scum formation causing deterioration of system

performances.
 As the result, in case of treating fat-containing wastewater particularly slaughterhouse effluent, the separation of acidogenic phase and methanogenic phase might be able to minimize those mentioned problems. Since, the acidification tank could not only reduce the quantities of easily float compounds like oil and grease but also provided partial degradation of low-biodegradable matters before applied to consecutive methane reactor.
 This study was thus conducted to provide data of slaughterhouse wastewater acidification in a completely stirred tank reactor (CSTR). The effect of hydraulic retention time (HRT) on process efficiency was investigated to approach the optimum operational condition for this kind of wastewater and also for other relevant fat-containing wastewater acidogenesis which to be used in further application.



Atul Borade
 GIC1571051Y

ANP Based Prioritization of VMI Issues

Atul Borade , Jana Sujanova , Sunil Dambhare
Jawaharlal Darda Institute of Engineering and Technology, Yavatmal, India

ABSTRACT

Vendor managed inventory (VMI) is a supply chain management technique adopted by organizations to manage the inventory. The technique is applied uniquely in each organization. It is broadly affected by barriers, benefits of implementation and readiness of organization. The barriers, benefits and readiness vary in each adoption. In order to have a successful adoption better understanding of these issues is essential. In this paper the barriers, benefits and readiness are correlated with popular multi-criteria decision making tool, Analytical Network Process (ANP). The clusters and nodes are analyzed to find most important issues. The results of the study would be useful for further analysis and serve as a guide for adoption.

Key words: vendor managed inventory, analytical network process, adoption issues



Chebrolu Venkata Thulasi-
 Varma
 YRA1571052

Time Varied Morphology Controllable Fabrication of NiS Nanosheets Structured Thin Film and its Application as a Counter Electrode for QDSSC
Chebrolu Venkata Thulasi-Varma, Chandu V.V.M. Gopi, S. Srinivasa Rao, Dinah

Punnoose, Soo-Kyoung Kim, Hee-Je Kim*
School of Electrical Engineering, Pusan National University, Gumjeong-Ku, Jangjeong-Dong, Busan 609-735, South Korea
heeje@pusan.ac.kr

ABSTRACT

A novel strategy has been successfully developed for highly efficient nanosheet-structured NiS counter electrodes. The NiS was deposited on FTO substrate with different deposition times using the simple and cost effective chemical bath deposition technique. The NiS CEs were used to grow high quality thin films containing nanoparticles, nanosheets, or nanorods. The nanosheet-structured NiS CE in QDSSCs under one-sun illumination (AM 1.5, 100 Mw cm⁻²) yielded a high short circuit current density (J_{sc}) of 13.53 mA cm⁻², open circuit voltage

	<p>(Voc) of 0.570 V, fill Factor (FF) of 0.450, and power conversion efficiency (η) of 3.47 %. These values are much higher than those of the Pt CE ($J_{sc}=7.85\text{mA cm}^{-2}$, $V_{oc}=0.611$, $FF=0.243$, and $\eta=1.170$ %). The NiS was strongly adhered on the FTO substrate by acetic acid which acts as stabilizer and strong reagent in this one step preparation. The performance of NiS CE was improved by the surface morphology, which enable rapid electron transport and a lower electron recombination rate for the polysulfide electrolyte redox couple. In the present study NiS has obtained higher electro-catalytic activity which plays a crucial role in the QDSSC. Electrochemical impedance spectroscopy and Tafel-polarization measurements were used to investigate the electro catalytic activity of the NiS and Pt CEs.</p>
<p>Moh Malik Afandi YRA1571053</p>	<p>Optimization of Solar Energy Utilization Using Concentrated Solar Hybrid Energy Harvester (CSHEH) Based on Smart Solar Panel and Concentrated Thermoelectric Generator</p> <p>Moh. Malik Afandi Department of Electrical Engineering Institut Teknologi Sepuluh Nopember Surabaya, Indonesia afandi.malik1206@gmail.com</p> <p>Dinda Dwi Chandrarini Department of Statistics Institut Teknologi Sepuluh Nopember Surabaya, Indonesia dindadwice@gmail.com</p> <p>ABSTRACT</p> <p>Many forms of community activities and national industrial sector are highly dependent on the availability of electrical energy. Unfortunately, at the end of 2014 the electrification ratio in Indonesia is only 80.5%. On the other hand, Indonesia is a tropical country that has high intensity of sunlight almost 10 hours per day throughout the year. Indonesia has a solar energy intensity of 4.0-4.9 kWh/m². This condition is potentially to be used as an alternative source of electrical energy to cover the electricity shortage, particularly in areas which is difficult to reach by existing electricity power. This paper will discuss about optimization of solar energy utilization through Concentrated Solar Hybrid Energy Harvester (CSHEH). CSHEH consists of Smart Solar Panel and Thermoelectric Generator. CSHEH is able to convert the two energy generated by the sun into electrical energy that is photon energy through the photovoltaic effect of solar panel and heat energy through Seebeck effect of thermoelectric. In case, CSHEH is able to provide an alternative solution to produce electricity, especially in isolated areas. As well as being stand alone, the advantages of CSHEH also does not require operating costs, and environmentally friendly because it just utilize solar energy as a source.</p> <p>Index Terms— Concentrated, Optimization, Smart Solar Panel, Thermoelectric</p>



Bob Andri
YRA1571054

Design Analysis And Performance Test Of Crawler Type Wheel On Granule Fertilizer Applicator (Cf01) For Palm Plantation

Bob Andri

Department of mechanical and biosystem engineering, Faculty of agricultural technology, Bogor agricultural university, Indonesia

ABSTRACT

Fertilization is an important thing in the plant treatment process. Fertilization is the process of adding nutrients, improved soil structure and replacing nutrients which is absorbed by plants. The goal of fertilization is to maintained or improved the soil fertility so that the plant can produce at its optimum. CFA01 machine is the granules fertilizer applicator machine with a midrib lifting mechanism. CFA01 machines is used to fertilize palm plant which is not has been harvested yet. From the results of the early performance test, CFA01 has many shortcomings, especially on the crawler wheel as its traction source. This research focused to modify and to do reverse engineering on CFA01 crawlers. This research also aims to analyze a design of crawler that already exists as a basis for designing new similar crawler by minimizing the weaknesses and improve the excellence crawler. Design and load simulation will be done using Solidworks software while construction and performance test will be done directly in Mechanical and Biosystem Engineering field laboratory, Bogor Agricultural University.

Keywords: crawler, CFA01, fertilization, SolidWorks

LISTENERS

Mustafa Hilmi Mercan Necmettin Erbakan University GIC1571051
Remani Saad Islam Department of English, Faculty of Linguistics, University of Biskra, Algeria. GIC1571054
Omar Afifi Civil Engineering Department GIC1571068
Nurul Ahadiyah Handini Department of economic education, Faculty of Economics, State University of Padang, Indonesia GIC1571084
Radha Krishna Department Of Chemistry GIC1571085

Tharunsathya Department Of Weaponology GIC1571086
Mohammad Almaraghi Private Universities Council - Ministry of Higher Education in Kuwait. GIC1571087
Nurul Ahadiyah Handini Department of economic education, Faculty of Economics, State University of Padang, Indonesia GIC1571084
Radha Krishna Department Of Chemistry GIC1571085
Tharunsathya Department Of Weaponology GIC1571086
Mohammad Almaraghi Private Universities Council - Ministry of Higher Education in Kuwait. GIC1571087
Veena Velaga Department Of Weaponology GIC1571088
Kennedy Mprah Department of English GIC1571089
Richard Thomas Cetgog Nigeria Limited, Badagry, Lagos, Nigeria GIC1571090
Mr. Moses oladele olawale Cetgog Nigeria Limited, Badagry, Lagos, Nigeria GIC1571091
Mohamad Ridwan Departmen of Mechanical and Biosystem Engineering, Faculty of Agricultural Technology, Bogor Agricultural University, Indonesia GIC1571092
Rizqomullah marsya Departmen of Mechanical and Biosystem Engineering, Faculty of Agricultural Technology, Bogor Agricultural University, Indonesia GIC1571093
Bob Andri Departmen of Mechanical and Biosystem Engineering, Faculty of Agricultural Technology, Bogor Agricultural University, Indonesia GIC1571094

M Munajat Department of Mechanical and Biosystem Engineering GIC1571099
Muhammad Wahyu Alfarisi Department of Mechanical and Biosystem Engineering, Faculty of Agricultural Technology, Bogor Agricultural University, Indonesia GIC1571101
Mohamad Ridwan Departmen of Mechanical and Biosystem Engineering, Faculty of Agricultural Technology, Bogor Agricultural University, Indonesia GIC1571102
Muhammad Afizh Department of Mechanical and Biosystem Engineering, Faculty of Agricultural Technology, Bogor Agricultural University, Indonesia GIC1571103
Shobowale Babatunde, Rufai Saheed Oladimeji, Shobowale Afolashade Abiodun, Titiloye Abiodun Olakunle Civil Engineer, Electrical Engineer, Facilities Engineer, Cetgog Nigeria Limited Badagry, Lagos, Nigeria GIC1571111