CONFERENCE PROCEEDINGS

17th International Conference on Researches in Science and Technology (ICRST), 21-22 July 2017, Bangkok, Thailand

21-22 July 2017

Conference Venue

Asian Institute of Technology (AIT), Conference Center, Bangkok, Thailand

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KEYNOTE SPEAKER

Ali Ghalehban

Assumption University of Thailand , Faculty of Science and Technology, Bangkok, Thailand

PLENARY SPEAKER

Hajime Hirao

Department of Biology and Chemistry, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong, Hong Kong

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Shriharsh Dixit GICECG1706054	Waste To Wealth: Rice Husk Reducing the use of Fossil fuel and Carbon footprint
	Ar. Shriharsh Dixit Faculty of Architecture (FOA), Manipal University Manipal, Karnataka, India
	Abstract: India is second largest rice producing nation in the world. However major attention is given on the final Rice quality whereas waste generated during this process is cornered. Rice husk is a co-product generated in the rice milling procedure. This husk contains around 22% of the total rice crop weight. This rice husk is disposed off by open-air burning or dumping which causes momentous local pollution. Burning consumes large amount of fossil fuel, affecting the fertility of the soil concurrently. Indian government is promoting the use of biomass for energy purposes to substitute the fossil fuel utilization and to reduce the environmental impact caused by them. To find solution for the Rice husk disposal, it becomes essential to ensure that the process used is harming the environment least way. The site area selected for the study is Gorad village, (approximately 6 acres) located in a rural area consisting of 6 tribal padas. Research aims to use the rice husk to generate electricity in a most environmental friendly way to satisfy the electrical demands of Gorad village. To achieve this, the research is divided into three main stages- Properties, contents and potential uses of rice husk; Data collection; and Data analysis using Life Cycle Analysis approach. Assorted methods such as literature review, questionnaires and interviews with the villagers contributes in the final design output. Results from the above stages are analysed in the context of necessary policy demands, the local government guidelines, the production process of generating electricity from rice husk, the infrastructure availability and distribution practicality of the electricity. Keywords: Biomass, Electricity, Environment, Fossil fuel, Off- Grid electrification, Rice crop, Rice husk.
Rupam Debnath GICECG1706057	Biogenic synthesis of antioxidant, shape selective gold nanomaterials mediated by high altitude lichens
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	Debraj Dhar Purkayastha Department of Chemistry, Assam University, Silchar 788011, Assam, India
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Dalip Kumar Upreti
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Abstract:

Biogenic synthesis of gold nanoparticles have been accomplished using dried biomass of two high altitude lichen species, collected from the alpine region of Eastern Himalaya in Arunachal Pradesh state of North East India, without addition of any external reducing or stabilizing chemicals. The nanoparticles were characterised by UV-visible, FT-IR spectroscopy, powder X-ray diffraction (XRD), and transmission electron microscopy (TEM). The as-obtained gold nanoparticles showed surface plasmon resonance (SPR) band at ~535 nm. The XRD study furnished evidence for the formation of face-centered cubic structure of gold nanomaterials. The nanoparticles produced with Acroscyphus sp. consisted of multiply twinned quasi-spherical and prismatic shapes while those accessed with Sticta sp. are exclusively multiply twinned. The biomatrix loaded gold nanomaterial exhibited pronounced antioxidant activity.
Keywords: Gold nanoparticles, North East India, lichen.

Mahtuf Ikhsan GICECG1706059	**Development of Mahogany Leaf (Swietenia macrophylla) as Source of Green Battery to Help Rehabilitation in Bukit Suligi Educational Forest**

Mahtuf Ikhsan
Department of Forest Management, Faculty of Forestry,
Bogor Agricultural University, Indonesia

Abstract:

Nowdays, major problem faced by Bukit Suligi Educational Forest is deforestation in which around 70 % FTC (Forest Training Facility) has been burned, and palm oil is illegally planted surrounding the area. From burned area, rehabilitation is the real choice to preserve Bukit Suligi Educational Forest. According to the problem, a study needs to be done to prove that there are trees in the forest that can produce an alternative energy for the community. This is what will change the perception of people who think the value of forest is lower than palm oil plantation. Utilization of mahogany leaf (*Swietenia macrophylla*) as one of alternative sources that can generate electricity based on the characteristics of mahogany leaf produces a bitter taste in the tongue entirely. This research is done by getting mahogany leaf in Bukit Suligi Educational Forest and making green battery model from mahogany leaf extract in Forestry Vocational School of Pekanbaru. Based on the results, 720 ml green battery model can generate electricity of 3,87 volts. Therefore, mahogany leaf extract is potential for a new alternative electrical energy. From this research, it can be expected that community around the forest will take an initiative to restore degraded forests with mahogany plant.
Keywords: mahogany leaf, green battery, rehabilitation.

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Technological performance assessments based on patent bibliometrics: A case of global concentrating solar power industry

Ching-Yan Wu
Fu Jen Catholic University

Ching-Yan Wu
GICECG1706055

Abstract

The goal of this study is to explore the technological performance of concentrating solar power technologies (CSP) at country level. This study used a set of dedicated patent classifications relating to the CSP technologies to search for patents in the Espacenet patent database and construct the dataset for this study. In total, 28,852 patent grants (constituting a total number of 17,531 patent families) published by worldwide patent-granting authorities between 1970 and 2015 have been extracted and careful examined. To better utilize the extracted dataset, this study applied a series of econometric indicators developed by Francis Narin in the 1990s, such as Cites per Patent, Current Impact Index, Technology Strength, Technology Cycle Time, Science Linkage, and Science Strength to analyze the quantitative technological performance for each of the major CSP players. The results show that the different technological capabilities focused by the top five players (i.e. Japan, China, the US, Korea, and Germany) reveal their respectively various technological strengths and national approaches in relation to the sustainable solution. Despite of the development of a sustainable economy is not able to be relied on the technology per se, the results of this study reflected the relationship between technological development and opportunity of commercialization in each major country.

Key words:concentrating solar power, patent bibliometrics, technological performance

A novel approach to high temperature sealing for electroceramic reactor: Application to dual-phase membrane with thermal cycling.

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Hang Qi
GICECG1706056

Abstract

Yttria stabilized zirconia-carbonate dual-phase membrane as a simple model system was studied to test the sealing of the dual-phase membrane system at high temperatures. Glass-ceramic used as sealing material was prepared and it melts at about 700-800 ℃, the molten phase glass-ceramic mixtures could fill the gaps between membrane and alumina tube support to seal the membrane system. However, the previous results show that the molten phase glasses were very mobile and could easily cover the membrane surface and block it, causes the membrane failed. Silver paste was used as sealing material, which is designed to reduce the mobility of glass-ceramic at high temperatures and improve the stability of the membrane system, the membrane selectively, long term test and the function of temperatures were tested separately and the results shows that CO_2 permeability at 850 °C was $7 \times 10\text{-}11$ mol m-1 s-1 Pa-1, while at 800 °C it decreased to $4 \times 10\text{-}11$ mol m-1 s-1 Pa-1 and $2 \times 10\text{-}11$ mol m-1 s-1 Pa-1 at 780°C. The sealing method gives a ratio of permeated CO_2 to leak N_2 of 15:1 at 850 °C.

Keywords: ionic conducting, dual-phase membrane, molten carbonate, carbon

	dioxide transport
V P Singh **GICECG1706058**	**Distribution And Extent Of Heavy Metals Pollution In Sedimentof Ganga River From Kanpur To Allahabad, India.** **V. P Singh** **Mohit Aggarwal** **Assistant Professor, Civil Engineering Department, MNNIT Allahabad, India** **A. N. Sawarkar** **P.G.S tudent, Civil Engineering Department, MNNIT Allahabad, India** **A. N. Sawarkar** **Assistant Professor, Chemical Engineering Department, MNNIT Allahabad, India** **Abstract** In this study the concentration of heavy metals (Cd,Cr,Cu,Fe,Mn,Ni,Pb,Zn,) were determined in sediment samples from the Ganga river, India. The toxic potential of studied metals was determined by evaluating enrichment ratio (ER), geo-accumulation index (Igeo) and pollution load index (PLI). Considering the spatial distributional patterns, the metals concentrations were higher at Manikpur site followed by Nawabganj, Dalmau-Fatehpur Bridge, Unchahar, Maharajpur, Shivrengpur, Jajmau, Sangam, Phaphamau and Sarsaul. The Igeo and ER values revealed that sediments in this study were moderately polluted by Lead (Pb) and significantly polluted by Cadmium (Cd) and considerably unpolluted by other metals. Evaluation of toxicity of metals based on mean PEC (probable effect concentration) quotient confirmed that the Gangariver is seriously contaminated with Cd and Pb. Outcomes of the spatial distribution pattern reveal that increase in industrialization and urbanization nearby the selected sites were sources of metal pollution. Appropriate measures should be taken by industrial units to ensure proper treatment of wastewater before discarding toxic effluents into the river. Government authorities should strictly enforce national environmental quality (NEQ) standards for municipal and industrial effluents to prevent further degradation of the Ganga river. Keywords: Ganga river sediments, Geo-accumulation, Heavy Metals, India, Metal enrichment
Anil Kumar **GICICRST1706053**	**Surface Quality Improvement in Electrical Discharge Machined Tungsten Carbide through Electrolysis Process** **Sangamdeep Singh** **Assistant Professor, Sri Sai College of Engineering & Technology, Badhani, Punjab, India** **Anil Kumar** **Associate Professor, Beant College of Engineering & Technology Gurdaspur, Punjab, India**

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	Abstract Electrical discharge machining (EDM) is widely used for machining difficult to machine materials. Tungsten carbide is one such material used in industry for making tools and dies. Surface defects like recast layer, micro-craters and cracks are produced after electrical discharge machining leading to decrease in surface quality. Post machining operations become necessary for removal of the damaged surface layer to restore surface properties. However, this extends the machining time and increases the cost of production. A relatively new advancement in this direction is to perform electrolysis process after EDM with a view to enhance surface quality of the machined surface. The focus of the present study is to evaluate the performance the electrolysis process after EDM by varying current and pulse on time keeping all other parameters constant. The performance is evaluated in the form of surface roughness (Ra) and recast layer. It was observed that both surface finish and recast layer thickness are highly improved through the electrolysis process. Keywords: Electrical Discharge Machining (EDM), Electrolysis process, Surface roughness (Ra), Recast layer
Naveen Beri **GICICRST1706054**	**Experimental Evaluation of Electrode Profiles on Electric Discharge Machining Performance on AISI D2 Steel** **Sourav Mahajan** **Assistant Professor, Sri Sai College Engineering & Technology, Badhani, Punjab, India** **Naveen Beri** **Associate Professor, Beant College of Engineering & Technology Gurdaspur, Punjab, India** **Abstract** Electro discharge machining is one of the non-traditional machining procedures used to produce a better-machined surface with high surface finish on difficult to machine materials. The objective of present research work is to study the influence of different electrode profile on surface quality during electric discharge machining. Best parametric setting is obtained using multiple response technique with AISI D2 die steel as work material and copper as an electrode. The input parameters selected in the present work are peak current, duty cycle, pulse on time and polarity. Taguchi Methodology was used to obtain the best parametric setting for material removal rate, surface roughness, and tool wear rate. Their after machining is performed at best parametric setting as proposed by multi-objective optimization using different electrode profile i.e. concave, convex, and flat bottom. Machined surface quality is evaluated in term of material removal rate (MRR), tool wear rate (TWR), surface roughness (Ra) and recast layer. It was found that 7mm (radius) concave bottom surface of the electrode resulted in the generation of minimum surface roughness and recast layer.
M.J. Sukhesh **GICICRST1706055**	**Effect of co-digestion on the biogas potential of the fruit and vegetable wastes with poultry manure.**

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Abstract:
Anaerobic co-digestion experiments were performed for Fruit and Vegetable Wastes (FVW) with poultry manure to investigate the biogas production. Three variables Viz., fraction of FVW (%), total solids (%) and inoculum to substrate ratio were adopted to study the biogas potential of the co-digested mixtures. Experiments were designed based On Central Composite Design (CCD) design and the effect was analyzed through Response Surface Methodology (RSM). A quadratic model was found to be suitable based on the observations obtained during the experimental trails and used to study the interactions. Co-efficient terms from the model implies that fraction of FVW(%) and total solids (%) found to be influences biogas production significantly.The results also showed significant interaction among adopted variables.The higher biogas production was obtained at FVW(%) of 20, and at 9% Total solids concentarion. Overall, Lower proportion of FVW(%), higher total solids produces higher biogas production leaving the effect of inoculum to substrtae ratio to be insignificant.
Key words:
Anaerobic digestion, Fruit and vegetable waste, poultry manure, Response surface methodology

Roopesh Kevin Sungkur **GICICRST1706060**	**Futurist view of Software Testing:** **A new methodology adopting agile development testing in V-model** **Mundita Awotar** **Computer Science and Engineering Dept, University of Mauritius, Reduit, Mauritius** **Roopesh Kevin SUNGKUR** **Computer Science and Engineering Dept, University of Mauritius, Reduit, Mauritius** **Abstract** **The goal of any business is to satisfy the needs of its target customers, and IT industry is not an exception from that rule. Thus, the upgraded version of the V-model testing is supposed to deal with the weaknesses of the original version in question by combining it with the method known as agile testing. At the beginning of the report, hypothesis such as the strengths and weaknesses of the existing V-model testing via literature review and interviews with respective specialists in the sphere were analyzed. Successively, the possible advantages of agile method of testing were then considered. Moreover, the report comes up with the ways in which the two models could be naturally combined to produce a much more effective one. Once the new model was presented, its strengths and weaknesses were assessed by the means of a case study analysis using metric and**

	a data analysis through a survey were conducted to evaluate the credibility of the futurist model. Promptly, the research found that the suggested testing model provides better results than the common version of V-model testing. Firstly, a real case scenarios under metric evaluation of the models have indicated that the proposed model is better than the V-model, since it can handle the following aspects; reduced testing time, debugging, prioritization of requirements , easy mapping of roles and improved visibility of project resources. Secondly, a survey data analysis highlighted various advantages of the future model. The top priorities of the new model from the respondent's perception were; the new model manages rapidly changing priorities, it accelerates time to market, it increases productivity and it improves quality. Keywords- Software Testing; V-model, Agile Development; Requirements; Debugging
Vivek Asati **GICICRST1706066**	**Synthesis and structure-activity relationship exploration of some potent anti-cancer thiazolidine-2,4-dione derivatives** **Vivek Asati** **Institute of Pharmaceutical Sciences, Guru Ghasidas Vishwavidyalaya (A Central University),** **Bilaspur- 495009, Chhattisgarh (India)** **Sanjay K Bharti** **Institute of Pharmaceutical Sciences, Guru Ghasidas Vishwavidyalaya (A Central University),** **Bilaspur- 495009, Chhattisgarh (India)** **Abstract** **On the basis of lead pharmacophore, a series of novel thiazolidine-2,4-dione derivatives, 4a-x were designed and synthesized as potential anticancer agents. The derivatives of this series confirmed by their solubility studies, Rf value, melting point and spectral analysis such as IR, 1H NMR, 13C NMR and mass spectroscopy. Inhibitory effect of synthesized compounds 4a-x on the viability of cancer and non-cancer cells was assessed using SRB (Sulforhodamine B) assay. The SAR study revealed that the benzene substituted groups on oxadiazole attached thiazolidine-2,4-dione moiety showed growth inhibition activity against MCF-7 cell line. Among the synthesized compounds, 4x with a 2-cyano phenyl showed the best profile of cytotoxicity comparable to that of adriamycin as standard anticancer agent. Molecular modeling studies of 5-(4-(1,3,4-oxadiazol-2-yl)benzylidene)thiazolidine-2,4-dione derivatives were showed similar structural alignment as crystal ligand of protein (PDB code: 4DTK) and exhibited hydrogen bond interaction with amino acid residues i.e. LYS67, GLU171, ASP128 and ASP186 of PIM-1 kinase. The results of biological activity and docking study may be helpful to understand the exact mechanism of anticancer activity of designed and synthesized compounds.**
Vineeta Yadav **GICICRST1706067**	**First Report Of Garlic Common Latent Virus In Garlic From Nigeria** **S. Majumder**

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Abstract

Garlic (Allium sativum L.) is one of the oldest known horticultural crops of the world. Several viruses belonging to the genera Potyvirus, Carlavirus, and Allexivirus are known to infect garlic and reduce their yield worldwide (Dijk, 1994; Walkey and Antill, 1989). This study was undertaken to investigate the status of viral infection in Nigerian garlic. Ten garlic bulbs collected in March of 2015 from two fields in Kano and Sokoto region of Nigeria were tested by direct antigen coated (DAC)-ELISA with antisera to Garlic common latent virus (GarCLV) (Bioreba, Reinach, Switzerland). All the samples were positive for GarCLV. To confirm the presence of GarCLV, reverse transcription (RT)-PCR was performed using primers published earlier (Majumder and Baranwal, 2014) and total RNA extracted from 100 mg of leaves with the RNeasy Plant Mini kit (Qiagen, GmbH, Hilden, Germany) according to the manufacturer's instructions. Expected amplicons of ca. 450 bp were obtained from all the samples tested. Direct sequencing of the PCR products from one sample produced a 418-bp long nucleotide sequence. It showed 95% identity with a garlic isolate from The Netherlands (GenBank accession No. AB004804). To our knowledge, this is the first report of GarCLV on garlic in Nigeria

Carlwin Dayagdag
GICICRST1706068

Development of Automated Fire Incident Report (AFIR) Miner from Social Networking Sites (SNS)

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Abstract

Disaster is any tragic event that is caused by nature or man made in which the lost in lives and property is very high. Fire pre/or Disaster warning as could be disseminated through Television, Radio, Government Websites, Short Messaging System (SMS) and Social Networking Sites (SNS) such as Facebook and twitter. SNS can be a tool for extracting an information during the four phases of the disaster; mitigation, preparedness, response; and recovery. Since these tools are fast and cheap, it would be a convenience to the community and policy makers to decide and act on a certain disaster. Data mining techniques are useful in SNS

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data extraction and segregating the relevant or valid pre/or disaster incident report. The objective of the study is to develop a prototype of the Automated Fire Incident Report (AFIR) Miner from Tweeter. Extracted tweets conatins lots of noise thats need filtering. Out of 145 extracted tweet from maliksi tres, bacoor city, cavite fire incident , 12% (17 out of 145) of it is fire related Tweets and classified as valid. While 88% (128 out of 145) of the total extracted tweet in the said fire incident is classified as invalid. Overall, AFIR Miner acquired 0.8% Accuracy level in fire related tweet validation. Thus, the researchers claimed that the AFIR Miner is an effective tool in Monitoring fire incident related tweets reported on twitter. Further study is recommended to enhance the fire incident monitoring tool.

Keywords: Data Mining, Social Networking, and Automated Fire Incident Report Miner

Vivek Asati GICICRST1706069	Design and synthesis of some potent thiazolidine-2,4-dione derivatives as anticancer agents

Design and synthesis of some potent thiazolidine-2,4-dione derivatives as anticancer agents

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Abstract
On the basis of lead pharmacophore, a series of novel thiazolidine-2,4-dione derivatives, 4a-x were designed and synthesized as potential anticancer agents. The derivatives of this series confirmed by their solubility studies, Rf value, melting point and spectral analysis such as IR, 1H NMR, 13C NMR and mass spectroscopy. Inhibitory effect of synthesized compounds 4a-x on the viability of cancer and non-cancer cells was assessed using SRB (Sulforhodamine B) assay. The SAR study revealed that the benzene substituted groups on oxadiazole attached thiazolidine-2,4-dione moiety showed growth inhibition activity against MCF-7 cell line. Among the synthesized compounds, 4x with a 2-cyano phenyl showed the best profile of cytotoxicity comparable to that of adriamycin as standard anticancer agent. Molecular modeling studies of 5-(4-(1,3,4-oxadiazol-2-yl)benzylidene)thiazolidine-2,4-dione derivatives were showed similar structural alignment as crystal ligand of protein (PDB code: 4DTK) and exhibited hydrogen bond interaction with amino acid residues i.e. LYS67, GLU171, ASP128 and ASP186 of PIM-1 kinase. The results of biological activity and docking study may be helpful to understand the exact mechanism of anticancer activity of designed and synthesized compounds.

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Sowmyya T
GICICRST1706071

Characterization of Lagenaria siceraria peel extract stabilized silver nanoparticles and their catalytic studies in dye degradation

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Abstract
Nanotechnology is an unfolding domain of science which deals with synthesis, characterization and applications of nanoparticles. There is an upsurge in the development of newer, cheaper and simpler methods of silver nanoparticle (AgNP) synthesis. The current work reports a simple, benign, beneficial and ecological route of synthesis of AgNPs from the vegetable peel waste of Lagenaria siceraria, which is usually discarded as vegetable waste. The aqueous extract of the peel of Lagenaria siceraria has been used as a reducing and stabilizing agent in the synthesis of stable AgNPs for the first time. The characterization studies of the synthesized AgNPs revealed a spherical morphology of the particles. The SPR band of the synthesized AgNPs was found at 420 nm. The zeta potential of the AgNPs was – 26.4 mV. The XRD data demonstrated the crystalline nature of the AgNPs. The synthesized AgNPs were used as a nanocatalyst in the degradation of Congo red and Bromocresol green dyes in the presence of sodium borohydride as the reducing agent. The dye degradation took place at a faster pace with silver nanocatalyst synthesized from the vegetable peel waste of Lagenaria siceraria. The method is very effective as it makes use of biodegradable waste peel in the AgNP synthesis. The method can be scalable for large scale synthesis of AgNPs. The AgNPs synthesized from the vegetable peel waste of Lagenaria siceraria can be further used for biomedical applications.
Keywords
Silver nanoparticles; Vegetable waste peel; Lagenaria siceraria; Characterization; Silver nanocatalyst

Sandeep Kumar Singh
GICICRST1706072

Total Phenolic, Flavonoid contents, In vitro Antioxidant and Anti-inflammatory activity of Polygonatum verticillatum (L.) All. rhizome extracts.

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Arjun Patra
Assistant Professor, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh (India)-495009.

Abstract
The aim of this study was to determine the TPC, TFC, antioxidant and anti-inflammatory activities of several extracts (petroleum ether, dichloromethane, chloroform, ethanol, and water) of Polygonatum verticillatum belongs to family Ruscaceae. DPPH, ABTS and TAC assays were used to assess antioxidant while

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protein denaturation model utilized for in vitro anti-inflammatory activity. Ascorbic acid and Diclofenac sodium were used as reference drugs. The effect of ethanol extract was found significant in the TPC, TFC contents as well as in antioxidant and anti-inflammatory responses in vitro when compared with the reference drugs. From the data obtained after GC-MS/MS studies, some potent phytoconstituents have identified, could be indicated as a key factor responsible for desired values in different extracts from the plant in the following order: EE>PE>AE>DE>CE respectively. From the present study, it can be concluded that both the Polygonatum verticillatum possessed remarkable in vitro antioxidant and anti-inflammatory effects and it was plausibly due to the polyphenols contents.

Keywords: Polygonatum verticillatum; TPC; TFC; ABTS; DPPH; Anti-inflammatory

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Amara Naseer
GICICRST1706073

Cloud Computing Security Threats and Attacks with their Mitigation Techniques

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Huang Zhiqiu
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Abstract
Cloud computing has emerged as a new computational paradigm for facilitating services to its consumersover the internet. Cloud computing offers many attractive promises to the general public or big companies like Amazon, Google, Microsoft, IBM etc., to maintain and upgrade their position in fast growing cloud computing environment and to enhance their services for a large number of users. However, apart from the enticing offerings of cloud computing the development of this technology is still in its infancy and many issues need to be resolved with security being the strongest barrier to its adoption. Security concerns is an active area of research, which needs to be addressed properly to avoid security threats and attacks which are disasters for both service providers and service consumers. This paper highlights cloud computing key concepts, its architectural principles, essential characteristics for cloud computing, key security requirements, security threats in cloud computing, security attacks in cloud computing, and future research challenges.

Keywords
Cloud computing, Security Threats, Security Attacks, Mitigation Techniques

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Expression of Endo-beta-1,4-xylanase from Trichoderma reesei in Pichia pastoris and Characterization of the Recombinant Enzyme

Isadonna Fortune Tengganu
Surya University

Isadonna Fortune Tengganu GICICRST1706074	**Dede Abdulrachman, MSc Nugen Bioscience Indonesia** **Abstract** Xylanase is an essential enzyme for many industries because of its ability to degrade xylan as a raw material. Although endogenous Trichoderma reesei encodes endo-β-1,4-xylanase activity, the expressed product often has many impurities and is secreted in a low amount. In this study, endo-β-1,4-xylanase 2 (Xyn2) from T. reesei TW was cloned into pPICZαA for extracellular heterologous expression in Pichia pastoris KM71H. The Xyn2 expression was regulated under the alcohol oxidase 2 (AOX2) promoter. A shake-flask cultivation of the trecombinant P. pastoris expressed a xylanase activity of 7,970 nkat/ml with 14,913 nkat/mg for the specific activity. The recombinant Xyn2 was estimated by SDS-PAGE to be 21 kDA and 23 kDA, which suggested glycosylation of some of the recombinant enzyme. The maximum activity of recombinant Xyn2 was at pH 5.5 and 55oC on beechwood xylan. The enzyme was stable over the pH range of 2.0-9.0 and temperature range of 30-50oC. The presence of EDTA and cations such as Mn^{2+}, Zn^{2+}, $Fe2$, Cu^{2+}, Na^+, K^+, Ca^{2+}, Mg^{2+}, and Co^{2+} did not affect the Xyn2 activity significantly. The non-purified enzyme was exclusively specific to xylan without any side activities. The expression level was increased up to 22,147 nkat/ml with 41,789 nkat/mg of specific activity by utilizing high cell density fermentation in a 5 L bioreactor. The high activity and specificity, coupled with the stability of the recombinant Xyn2 in a wide pH range makes it very valuable for industrial applications.
Vijay Kumar GICICRST1706051	**Soil Liquefaction And Its Evaluation Based On Spt By Soft-Computing Techniques** **Vijay Kumar** **Assistant Professor, Motilal Nehru National Institute of Technology Allahabad, Allahabad, India** **Anupam Rawat** **Assistant Professor, Motilal Nehru National Institute of Technology Allahabad, Allahabad, India** **Abstract** Damages due to earthquakes in the 21st century have attracted many researchers and engineers on the seismic safety of densely populated cities. Allahabad is one of the fastest growing cities in Uttar Pradesh (India). It is situated on the bank of river Ganga and Yamuna. Most part of river Ganga carries alluvial soil which is one of the most important parameter that influences liquefaction potential of soil. Several factors that also can affect liquefaction behavior of soil that are local site condition, water table location etc. Present research work motivates on evaluation of liquefaction potential of soil by semi-empirical methods (like Modified Seed's method, Idriss and Boulanger (I&B) method & Tokimatsu and Yoshimi (T&Y) method). This evaluated liquefaction value had been used as output/target value for developing the soft computing

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models. Artificial Neural Network (ANN) & Adaptive Neuro Fuzzy Inference System (ANFIS) techniques have been adapted to the development of soft computing models. I&B method gives more conservative results than other one semi empirical methods.

Keywords: Earthquakes, Liquefaction, Artificial Neural Network (ANN), Adaptive Neuro Fuzzy Inference System (ANFIS).

Anupam Rawat **GICICRST1706052**	**Prevention Of Soil Erosion At The Banks Of River Ghaghra By Chemical Soil Stabilization** **Ashwani Kumar** Master Scholar, Civil Engineering Department, Motilal Nehru National Institute of Technology Allahabad-211004 **Anupam Rawat** Assistant Professor, Civil Engineering Department, Motilal Nehru National Institute of Technology Allahabad-211004 **A.K. Sachan** Professor, Civil Engineering Department, Motilal Nehru National Institute of Technology Allahabad-211004 **Abstract** In this paper, fly-ash is used for the stabilization of the soil along the banks of river Ghaghra to prevent soil erosion that is caused by the flood. The sample from the site was obtained and different index properties test were performed. According to the optimum moisture calculated, the percentage of moisture content for the soil fly-ash mixture is taken as 25%. Three samples with fly-ash percentage viz. 10%, 15%, 20% are prepared and further direct shear test is performed. It can be seen that the 15% Fly ash-Soil sample is found to be appropriate for preventing the lateral erosion as the shear strength of the 15% fly-ash mixture is greater than the critical shear strength of the soil. Thus the use of fly-ash can be effective in improving the index properties of soil present at the site. Keywords: Soil Erosion, Soil Stabilization, Geomorphology, Sedimentology, Regolith
Rahul Dev **GICICRST1706055**	**Theoretical Analysis Of A Proposed Solar Water Heating System Made Of Non-Metallic Materials** **Rahul Dev** Department of Mechanical Engineering, Motilal Nehru National Institute of Technology Allahabad, Allahabad, Uttar Pradesh-211004, India **Kirti Tewari** Department of Mechanical Engineering, Motilal Nehru National Institute of Technology Allahabad, Allahabad, Uttar Pradesh-211004, India

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Abstract

Solar Water heating is a renewable energy based technology. It requires solar radiation received from the sun to heat the water using thermosiphon process. In this paper, a solar water heater (SWH) of capacity 200 L is proposed which is made of non-metallic materials such as fibre reinforced plastic (FRP) and acrylic. A solar photovoltaic (PV) panel is also used to generate the electricity which can also be used for the forced mode circulation of the water. A thermal model is developed and performance is analysed for the climatic condition of Allahabad ($25.4358°$ N, $81.8463°$ E). The result shows that the maximum temperature of water in tubes of collector and storage tank for the month of April'2016 are $66^{0}C$ and $64.2^{0}C$ respectively. Electrical efficiency and overall efficiency of the system has been found to vary between 10-11% and 20-23% respectively.
Keywords: Acrylic, Coating, Solar water heating, Thermal model, Conventional water

Computational Studies of Organic Reactions on Various Catalytic Platforms

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Hajime Hirao
GICICRST1706056

Abstract:

The physical principles used in computational chemistry underlie all branches of chemistry; as such, computational chemistry has unlimited potential to contribute to the advancement of fundamental chemistry in every different subdiscipline as well as to finding solutions to critical challenges that humankind faces today, such as healthcare and energy/environmental issues. With this in mind, our computational exploration of chemistry applies quantum chemistry, multiscale QM/MM and QM/QM approaches, and many other advanced computational chemistry techniques to a broad range of complex molecular systems such as metalloenzymes, transition-metal catalysts, drugs/drug targets, metal-organic frameworks (MOFs), and nanomaterials. In particular, using computational approaches and often with experimental collaborators, we seek to derive information about chemical reaction mechanisms and bonding patterns of these complex molecules. We are also developing efficient computational methods and algorithms, in the hope that our new computational methods will expand the capability of computational chemistry and thereby enable one to simulate the behavior of complex molecular systems with higher reliability and predictability in the future.

Bahaa Talaat Shawky **GICICRST1706057**	**Conversion of rice straw to fermentable sugars and bioethanol by MFEX pretreatment and sequential fermentation** **Bahaa Talaat Shawky** **Microbial Chemistry Department,** **Genetic Engineering and Biotechnology Research Division** **National Research Centre,** **33 El Bohouth Street (former El Tahrir Street),** **Dokki, Giza, 12622 Egypt** **Abstract** **The global rise in energy consumption, predicted increase in energy demands, unexpected price fluctuations, depletion and well-documented drawbacks of fossil fuels have converged to create an urgent need to develop more sustainable energy systems based on renewable feedstocks. Conventional crops are unable to meet the global demand of bioethanol production due to their primary value of food and feed. Therefore, lignocellulosic biomass are attractive feedstocks for bioethanol production. Agricultural wastes are cost effective, renewable and abundant. Rice straw is a promising feedstock for sustained production of bioethanol and value-added products. Bioethanol from lignocellulosic biomass could be a promising technology though the process has several challenges such as biomass transport, and efficient pretreatment methods for total delignification of lignocellulosics. Pretreatment is a prerequisite step for increasing the enzymatic digestibility of agricultural residues for conversion to biofuels and value-added products in biorefineries. The present study highlighted the merits of a new pretreatment called Multipurpose Fiber Expansion (MFEX), where rice straw is treated with steam and carbon dioxide in sequence to make use of the synergistic effects obtained under pressure and moderate temperature for a few minutes and then rapidly releasing the pressure. MFEX is a promising method for pretreating rice straw for bioethanal production. A total reducing sugars of about 645 mg/g dry treated rice straw was achieved within 24 hours hydrolysis using laboratory prepared cocktail cellulolytic enzymes. Of this total, about 400 mg/g was glucose, which was rapidly fermented within 24 hours by a genetically-engineered *Klebsiella oxytoca* leading to bioethanol yield of about 375 mg/g dry treated rice straw. Biofuels provide a potential and promising green alternative to avoid the global environmental crises that arise from dependence on fossil fuels. Conversion of glucose as well as xylose to bioethanol needs some improved co-fermentation technologies, to make the whole process cost effective.** **Keywords: Conversion technology - rice straw - MFEX pretreatment - fermentable sugars - bioethanol**
Moh'd El Khatieb **GICICRST1706058**	**Variation of concrete modulus of elasticity due to the variation of concrete composition** **Moh'd El Khatieb** **Department of Civil Engineering, Zarqa University, Zarqa, Jordan**

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Abstract
Tensile Modulus - Young's Modulus or Modulus of Elasticity - is a measure of stiffness of an elastic material. It is used to describe the elastic properties of objects like wires, rods or columns when they are stretched or compressed. The modulus of elasticity, denoted as E, is defined as the ratio between normal stress to strain below the proportional limit of a material, according to ASTM E6-89, and it is used to measure instantaneous elastic deformation. Since no test exist to evaluate the direct elastic modulus of concrete, the proportional limit is evaluated by means of ASTM C 39 first, and this value is used to establish the limit used for the curves in the repeated applications of load. The elastic modulus is then calculated by determining the slope of the straight line in the stress-strain diagram. When concrete is subjected to loading, it exhibits a linear stress-strain relationship in the elastic range. The ratio, which is the slope of this linear portion of the relationship, is known as the modulus of elasticity. The elastic limit is "the greatest stress which a material is capable of sustaining without any deviation from proportionality of stress to strain (Hooke's law. When a load is applied to concrete, it will deform depending on the magnitude of the load and its rate of application. The value of strain is of immense importance because it represents the rigidity of the structural design and the stress at which the concrete will experience permanent deformation if exceeded. Most structures are subject to cyclic loading and it is, therefore, important to know the elastic portion for design purposes, especially the amount of steel required for reinforcement. According to Klieger and Lamond, modulus of elasticity can be measured in tension, compression, or shear. The modulus of elasticity can be measured by means of Strain Stress Unloading Loading Tangent and Secant modulus.

Simple Design Of Dye Water Filtering System For Clean And Healthy Water Quality

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Abstract
The demand of clean and healthy water services in the community require

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innovation of appropriate technology, for instance through the development of filtering to groundwater systems or to water wells with high turbidity levels in order to meet the water quality standards based on health requirements. The proposed design of dye water filtering system utilizes simple filter media such as sand, gravel, active charcoal and palm fibers. The purpose of this study is to determine the ability of the dye water filtering system to reduce turbidity, contaminations of Ferrum (Fe) and Manganese (Mn) and total coliform bacteria. It is expected that the proposed design of dye water filtering system may produce clean and healthy water with good quality. The laboratory test results indicate that proposed design is effectively to reduce the turbidity level and the Fe concentration that contaminated in the water. Meanwhile, it still is necessary to increase the capability of filtering system by replacing the sand with smaller diameter in order to decrease the levels of Mn and adding disinfectant in order to minimize the concentrate of total coliform bacteria.

Keywords: Dye water filtering, filter media, turbidity, contaminants of Fe and Mn, Coliform bacteria.

Norihan M. Arifin
GICICRST1706063

Effect of partial slip boundary condition on the MHD stagnation-point flow of Carreau fluid past a permeable shrinking sheet

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Abstract
The objective of the present study is to analyze the development of the slip effect on the MHD stagnation-point flow of Carreau fluid past a shrinking sheet. The mathematical modeling of Carreau fluid has been developed for boundary layer problem and the governing partial differential equations are transformed into ordinary differential equation using self-similarity transformation. The effect of velocity slip is taken into account and controlled by non-dimensional parameter. The dual solutions are obtained when the sheet is shrunk. The study shows that the skin friction decreases with an increase in velocity slip.

Melfei Bungihan

The Immunomodulation Action of Ganoderma lucidum and Chrysanthemum indicum Linn. and Their Pre-clinical Evaluation in Lowering Atherosclerosis Risk Factors in Hypercholesterolemia Rats (Rattus albus)

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College of Teacher Education, Quirino State University, Diffun, Quirino, Philippines,

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GICICRST1706064	**Balonquita, Mark Dela Cruz** **Saint Mary's University Senior High School, Bayombong, Nueva Vizcaya, Philippines**
	Abstract **This research aimed to address cardiovascular disease, specifically atherosclerosis, by using Ganoderma lucidum and Chrysanthemum indicum extracts, and evaluate the immunomodulating action in response to inflammation and infection. Beta-glucans from G. lucidum and extract from flowers of C. indicum were used. Toxicological analysis through average lethal dose (ALD) by single-dose method and basic pharmacological-toxicological effects on Rattus albus were done. Biochemical factors in R. albus like serum total cholesterol (TC), triacylglycerol (TAG), low density lipoprotein cholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C) were assayed. The rats were fed on high fat diet and were induced with cholesterol to increase the levels, then treated with the different treatments. Immunomodulation was evaluated by measuring the immunoglobulins A, G and M on Escherichia coli infected rats before and after treatment. For proliferation of lymphocytes, whole blood was collected on carrageenan inflammation-induced rats before and after treatment and the percentage lymphocytes were determined by a flow cytometer. Results show that there was a decrease in the TAG (t=1.329,sig. 0.211), TC (t=4.956, sig. <0.0001), HDL-C (t= 0.486, sig. 0.636) and LDL-C (t=0.819, sig. 0.429) after treatment with the extracts but only the decrease in total cholesterol (TC) was significant at α 0.05. For the immunoglobulin levels, paired t-test results show that there was significant decrease in IgM (t= 2.969, sig. 0.013) and IgG (t= 3.865, sig. 0.003) while no significant decrease in IgA (t=1.683, sig 0.130). Comparison of the treatments using ANOVA showed significant differences between treatments in IgA (F(3,8) =8.458 , p = 0.007.) and IgG (F(3,8) -174.115, sig. <0.0001) but not significant in IgM (F(3,8) = 3.998 , p =.148). There was also significant increase in the number of lymphocytes on R. albus (t=2.659, sig. 0.019) but ANCOVA showed that there are no significant differences in the different treatments (F=0.805, sig. 0.530) suggesting that all treatments were comparable in their effects in proliferating lymphocytes. It can be concluded that G. lucidum beta glucans and flower extracts from C. indicum are safe and effective either as single dose or in combination in lowering atherosclerosis risk factors and in immunomodulation.** **Keywords: Cardiovascular disease, Atherosclerosis, Immunoglobulins, Lymphocytes, Ganoderma lucidum, Chrysanthemum indicum**
 Imran Hussain **GICICRST1706070**	**School Of Innovation** **Imran Hussain** **University,Pakistan** **Abstract** **India's future rests on its ability to harness the creative potential of its large young population. In order to foster innovation and creativity, problem and project-based learning (PBL) play an important role. These help to link**

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education to relevant in real-life experience and this connection is crucial for engaging the young minds and increasing their motivation levels. Undertaking innovative experiments, projects and problem solving exercises in multi-disciplinary set up brings joy to learning. The enjoyment factor involved in such engagement enhances young people's motivation and interest levels, thereby opens doors for flow and creativity. Thus, provision of innovation spaces in schools and colleges, museums and science centers or institutions of non-formal learning, where such activities can be undertaken is recognized to play an important role in fostering creativity and inspiring innovation by young students. This will ultimately lead to developing a culture of innovation in the country.

Marina Arino Martin GICICRST1706075	**Photodegradation of (E)- and (Z)-endoxifen by UV light: By-products identification and toxicity assessment**

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Civil and Environmental Engineering Department, North Dakota State University, Fargo, ND, USA

Abstract

Endoxifen is an effective metabolite of a commonly used chemotherapy agent, tamoxifen. Endox-ifen has been detected in the final effluent of wastewater treatment plants. The release of endoxifen into the water environment could bring negative effect to aquatic lives due to its antiestrogenic activity. This research investigates ultraviolet (UV) radiation (253.7 nm) application to degrade endoxifen in water and wastewater and the generation of phototransformation by-products (PBPs) and their toxicity. The effects of light intensity, pH and initial concentration of (E)-and (Z)-endox-ifen on the photodegradation rates were also investigated. Endoxifen was eliminated from water by at least 99.1% after 35 seconds of irradiation (light dose of 598.5 mJ cm-2). Light intensity and initial concentration of (E)- and (Z)-endoxifen exhibited positive linear correlations with the pho-todegradation rates while pH had no effect. Photodegradation of (E)-and (Z)-endoxifen in water results in three PBPs. Toxicity assessments through modeling of the identified PBPs suggest higher toxicity than the parent compounds. Photodegradation of (E)- and (Z)-endoxifen in wastewater at light doses used for disinfection in WWTPs

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	resulted in reductions of (E)- and (Z)-endoxifen by at least 30, 44, and 71% at the light doses of 16, 30, and 97 mJ cm-2, respectively. Two of the three PBPs observed in the experiments with water were detected in the experiments in wastewater. Therefore, highly toxic compounds are potentially generated at WWTPs during UV disinfection process if (E)- and (Z)-endoxifen are present in the treated wastewater. The release of these toxic PBPs to receiving water bodies could bring detrimental effect to the aquatic environment. Key words: Endoxifen, photodegradation, toxicity assessment, UV light, water, wastewater.
Meng-Hsuan Chung **GICICRST1706076**	**Numerical Simulation of Conjugate Heat Transfer on Arbitrarily Moving Fluid-solid Interfaces** **Meng-Hsuan Chung** **Department of Naval Architecture and Ocean Engineering, National Kaohsiung Marine University, Taiwan** Abstract: This study developed and validated a numerical method to handle problems with mixed-convection conjugate heat transfer over arbitrarily moving/deforming fluid-solid interfaces. We will base the development on the finite-volume adaptive Cartesian grid method with the cut cell approach developed and matured previously. None of the studies in literature tackled the issue of conjugate heat transfer across moving/deforming interfaces, although some have successfully dealt with both prescribed-temperature and prescribed-heat-flux boundary conditions. The present work benefited from the merit of the cut cell approach, adapting to various types of boundary condition in a unified manner, to implement the boundary conditions required of the conjugate heat transfer. The proposed numerical method has globally second-order accuracy in both space and time, although the temporal accuracy is locally reduced to first order for solution cells adjacent to moving fluid-solid interfaces. Some validation cases were simulated to demonstrate the effectiveness and order of accuracy of the numerical method. Keywords: Conjugate heat transfer; Arbitrarily moving/deforming fluid-solid interface; Finite volume; Adaptive Cartesian grid method; Cut-cell

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