



## **Conference Proceedings**

**ICSTR Melbourne – International Conference on Science & Technology  
Research, 05-06 March 2020**

**05-06 March 2020**

## **CONFERENCE VENUE**

**Victoria University City Convention Centre, City Flinders Campus,  
Melbourne, Australia**

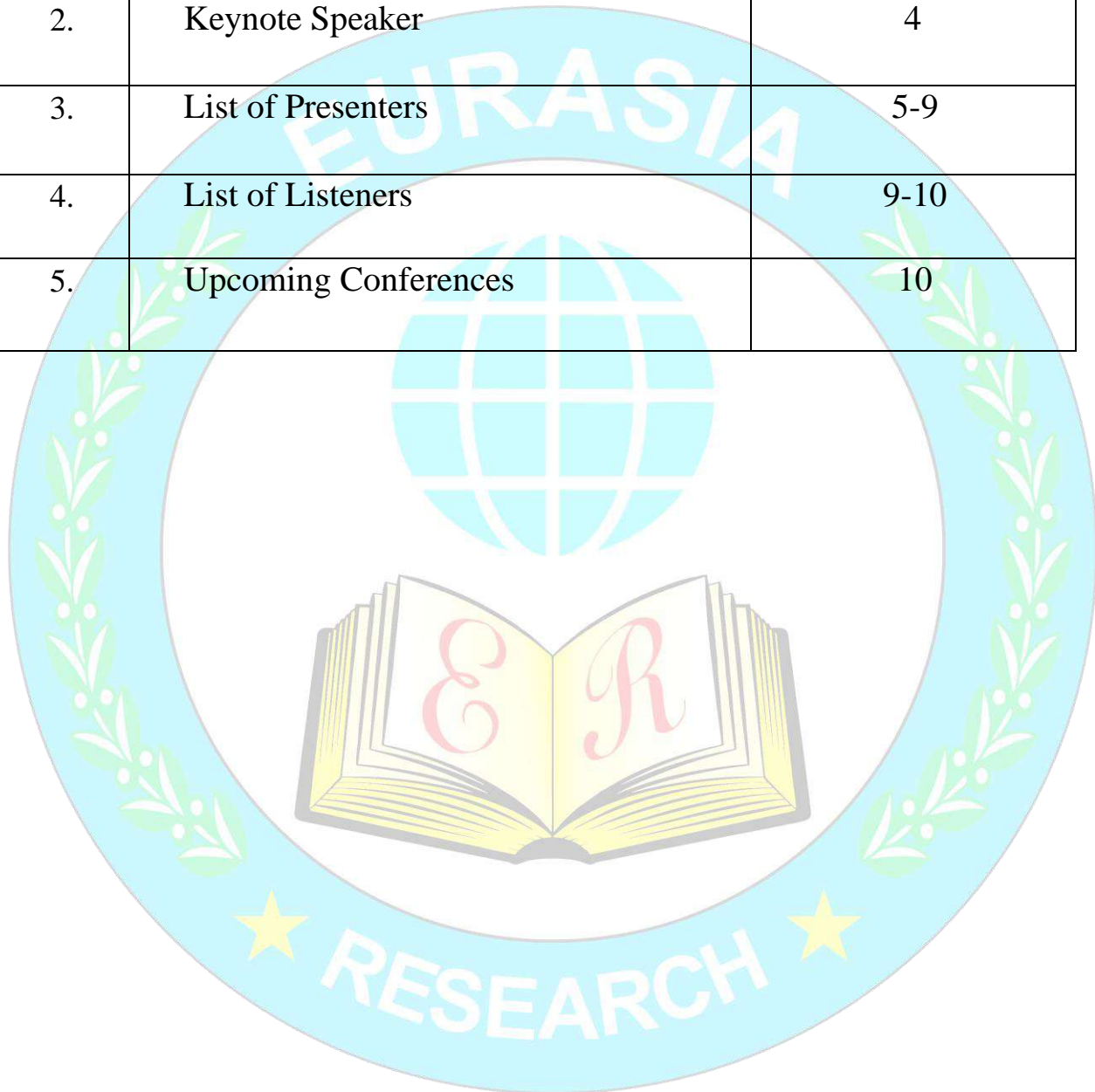
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**Preface:**

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## **KEYNOTE SPEAKER**



**Dr. Holger Nord**

**Area Manager, Victorian School of Languages, Australia**

With more than 20 years of teaching experience in tertiary as well as school settings in many countries. Dr. Holger Nord has developed a keen interest in the ‘critical’ of educational theory and practice. Consequently, his list of presentations and publications range from post-colonial inquiries to new ideas in/for education and policies. He has been an area manager for the Victorian School of Languages (Australia, South East) since 2013 and is currently engaged in organizing workshops in Australia as well as overseas. Based firmly on Critical Pedagogy and its thinkers he continues to see Education as a political and transformative act, with language(s) as one of the most critical elements in it.

## PRESENTERS

<p><b>Mohammed Saleh</b> ERCICSTR2002051</p>	<p style="text-align: center;"><b>Cyber Security Analysis of the Digital Transformation Era</b></p> <p style="text-align: center;"><b>Mohammed Saleh</b> Department of Computer Information Science, HCT, Sharjah, UAE</p> <p style="text-align: center;"><b>Abstract</b></p> <p>The global digital transformation era is shaping the fourth industrial revolution and is influencing business and economic trends in a significant way. End-users are now able to utilize various technological systems and applications to run their normal operations. Unfortunately, the digital transformation has led to increased security challenges to the companies adopting such technologies. Many companies that have adopted many of the digital systems have ended up suffering sophisticated attacks that have left them with catastrophic losses. This paper researches extensively the various cyber-attack, vulnerabilities and risks that digitized companies and organizations could be facing. Further, the paper identifies some solutions to the cyber-attacks that companies and organizations that digitize could face. The paper also makes some recommendations on the way companies can be able to eliminate some of the challenges arising with their adoption and utilization of digital systems and applications.</p> <p><b>Keywords:</b> Digitization, Cyber Security, Fourth Industrial Revolution</p>
 <p style="text-align: center;"><b>Hai Min</b> ERCICSTR2002052</p>	<p style="text-align: center;"><b>The Status Expectation in Different Situations and Its Influence on Individual Behavior Decision-making among Chinese College Students</b></p> <p style="text-align: center;"><b>Min Hai</b> School of Psychology, Shaanxi Normal University, Xi'an, 710062</p> <p style="text-align: center;"><b>Tinghu Kang</b> School of Psychology, Northwest Normal University, Lanzhou, 730070</p> <p style="text-align: center;"><b>Yonghui Wang</b> School of Psychology, Shaanxi Normal University, Xi'an, 710062</p> <p style="text-align: center;"><b>Abstract</b></p> <p>The status phenomenon is a reflection of the mutual connection among people in social relations and reflects the unique way of individual existence in social life. Previous researches mainly emphasized the distinction and identification of status, as well as the characteristics and attributes of status. However, it is of great value to study status as a non-economic resource and discuss individuals' expectations of pursuing status in specific social situations. Therefore, this study explored the influence of individual status expectation and individual behavior decision-making in specific situations. Three experiments were designed in this study. Experiment 1 used the within-experimental design of 2 (status type: symbolic, concrete) x 2 (academic performance: well, poorly) to analyze the status expectations differences in different academic performance. Experiment 2 used the within-experimental design of 2 (status type: symbolic, concrete) x 2 (job performance: well, poorly) x 2 (interpersonal relationship: warm, cold) to analyze the status expectations differences in different job performance and interpersonal relationship situations. Experiment 3 used the within-experimental design of 3 (prestige: low, general, high) x 3 (title: professor, associate professor, lecturer) to analyze the influence of different status categories on individual behavior decision-making. The results showed that Chinese college students had different status expectations in different situations. The expectation of symbolic status was higher than that of concrete status, and the influence of symbolic status on individual behavior decision-making was higher than concrete status.</p> <p><b>Keywords:</b> Students, Situations, Status Expectations, Behavior Decision-Making</p>
<p><b>Abdul Aziz</b> ERCICSTR2002053</p>	<p style="text-align: center;"><b>Selection of Indigenous Bacteria Isolate that Produce Cellulase and Enzyme Characterization for Wood Chips Pretreatment</b></p>

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**Abstract**

Cellulase is a group of hydrolase enzyme including endoglucanase, exoglucanase and  $\beta$ -glucosidase which break the  $\beta$ -1,4 glycosidic bond in cellulose, sedodextrin, selobiose, and other cellulose derivatives. The purpose of this research is to select the most potential isolate as cellulase producers and to determine the character of enzyme produced by the most potential isolate. The isolates selected in this study consisted of seven bacterial isolates. Cellulase activity test showed that RA-1 isolate with the highest cellulolytic index (3.314) has the highest activity among the other isolates with a value of 1.367 U/mL. The highest activity was obtained at pH 7 and incubation temperature of 60 ° C. The electroforegram of zymogram showed that the enzyme molecular weight is estimated at 52.480 kDa (RA-1 & RCc) and 40.498 kDa (B.RK-2). Metallic ions of Ca<sup>2+</sup>, K<sup>+</sup>, Zn<sup>2+</sup>, Mg<sup>2+</sup> and Fe<sup>2+</sup> act as enzyme inhibitor that produced by RA-1 isolate while Mn<sup>2+</sup> metal ion act as activator.

**Keywords:** Cellulase, Cellulolytic, Enzyme, Hydrolase, Zymogram

Taranjit Singh  
ERCICSTR2002054

**Advances in Functionally Graded Ceramics – Processing, Sintering Properties and Applications**

Taranjit Singh

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**Abstract**

In multilayered structures, sharp interface is formed between the layers of dissimilar materials. At this interface, the large difference in thermal expansion coefficients of the two dissimilar materials generates residual thermal stresses during subsequent cooling. These stresses lead to cracking at the interface, and these cracks lead to the deterioration of mechanical properties, and finally crack propagation leads to the delamination of the multilayered structure. Scientific progress in the field of material technology, and the continuing developments of modern industries have given rise to the continual demand for ever more advanced materials with the necessary properties and qualities. The need for advanced materials with specific properties has brought about the gradual transformation of materials from their basic states (monolithic) to composites. Recent advances in engineering and the processing of materials have led to a new class of graded multilayered materials called Functionally Graded Materials (FGMs). These materials represent a second generation of composites and have been designed to achieve superior levels of performance. This chapter looks at the best processing technologies and the uses and applications of the advanced, high quality products generated, and also presents an extensive review of the recent novel advances in Functionally Graded Ceramics (FGCs), their processing, properties and applications. The manufacturing techniques involved in this work have involved many concepts from the gradation, consolidation and different sintering processes. Each technique, however, has its own characteristics and disadvantages. In addition, the FGC concept can be applied to almost all material fields. This chapter covers all the existing and potential application fields of FGCs, such as engineering applications in cutting tools, machine parts, and engine components, and discusses properties of FGCs such as heat, wear, and corrosion resistance plus toughness, and their machinability into aerospace and energy applications.

**Keywords:** Functionally graded ceramics (FGCs), Classification, Design and Processing, Applications





Sunil Kumar Ghosh  
ERICICSTR2002061

**Formulation of plant based insecticides, their bio-efficacy evaluation and chemical characterization**

Sunil Kumar Ghosh

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**Abstract**

The aim of this study was to develop Emulsifiable Concentrate (EC) formulations from seed oils of *Pongamia pinnata* L., *Pachyrhizus erosus* L. and *Annona squamosa* L. Insecticidal efficacy of developed formulations was tested in-vitro against cabbage aphid (*Brevicoryne brassicae* L.) and in-vivo against aubergine aphid (*Aphis gossypii* G.) and whitefly (*Bemisia tabaci* G.). EC formulations comprising of seeds extract (40%) were prepared using bio-degradable solvents (50%) and emulsifier blends (10%) with hydrophilic-lipophilic balance (HLB) value (12.54) suitable for the seed oils formulation. Among nine EC formulations prepared from seed oils of each plant, EC-1 type performed well in terms of emulsion stability, cold test, accelerated storage and flash point test indicating feasibility for their commercial production. In-vitro study of *A. squamosa* 40 EC at 1% dose caused the maximum mortality of 80.7% (LC50 ¼ 0.08%) against *B. brassicae* at 72 h after the treatment. The bio-efficacy was comparable with the synthetic insecticide dimethoate 30 EC at 0.1% dose. Besides *A. squamosa*, the 40 EC formulation of *P. pinnata* at 1% dose having 70.6% mortality at 72 h after treatment (LC50 ¼ 0.19%) was also found promising. In-vivo studies in brinjal also indicated the maximum reduction of aphids (67.3–72.3%) and whiteflies (67.5–75.6%) within 5–14 days after application of *A. squamosa* 40 EC formulation at 1.0% dose followed by *P. pinnata* 40 EC. The total flavonoids and phenolic content in all the crude seed extracts varied from 20.9 to 53.9 mg QE/g and 5.8–9.5 mg GAE/g, respectively. Further analysis of the extracts by GC-MS revealed some bioactive constituents belonging to fatty acids, esters, aldehyde, phenols, etc. The study unveiled its significance in developing herbal insecticidal formulations as an alternative to harmful synthetic chemical insecticides and a step forward towards development of a promising eco-friendly technology in crop protection.

**Keywords:** *Annona Squamosa*, *Pachyrhizus Erosus*, *Pongamia Pinnata*, Emulsifiable Concentrate Formulation, Chemical Characterization, In-Vitro And In-Vivo Efficacy

Nurasmat Mohd Shukri  
ERICICSTR2002064

**Detoxification of Heavy Metals from Different Aquatic Species Using Catalytic Chelation Technique**

Nurasmat Mohd Shukri

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**Abstract**

*Claridae*, *Rastrelliger Kanagurta* and *E. affinis* are the most common fish species in Malaysia. Currently, there is no commercial technology has been developed for the removal of heavy metals from contaminated fish species especially *Claridae*, *Rastrelliger Kanagurta* and *E. affinis*. Therefore, the objective of this study is to investigate the effectiveness of chelation and catalytic chelation technique for the removal of heavy metals from fish species. In this study, heavy metal analysis conducted using Flame Atomic Absorption Spectroscopy (FAAS). The initial concentration of heavy metals in three different fish species were recorded above the World Health Organization (WHO) and Malaysian Food Regulation (MFR) (1985). Three types of chelating agents were applied which are trisodium citrate, disodium oxalate and sodium acetate trihydrate. Meanwhile, two types of catalysts supported on Al<sub>2</sub>O<sub>3</sub>, which are CaO and MgO were used. The optimum conditions used in this study were 400 mg/L, dosage of chelating agents for 1 hour of treatment at temperature 36.50±0.50°C. Chelation technique gave over 90% removal of Pb, Cu, Cd and Ni from different fish species. Then, the addition of catalysts to the chelation technique gave significantly lower removal percentage as compared to chelation treatment. However, among the two catalysts studied, CaO/Al<sub>2</sub>O<sub>3</sub> calcined at 1000°C gave the highest percentage removal of heavy metals, with stirring at 36.50±0.50°C for 1 hour. Therefore, this study showed that chelation technique at optimum conditions capable of removing heavy metals from different fish species to achieve the permissible limit set by WHO and MFR.

Robert Amanor Atiemoh  
ERICICSTR2002066

**Effect of Ultrasound-Ethanol Pretreatment on Drying Kinetics, Quality Parameters, Functional Group and Amino Acid Profile of Apple Slices Using Pulsed Vacuum Drying**

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**Abstract**

The influence of ultrasound-ethanol (US-E) pre-treatment duration (10, 20 and 30 min) on apple slices dried with varied temperature (60, 70 and 80 °C) using pulsed vacuum dryer was investigated. The results showed that untreated sample (control) took 375, 325 and 225 min to achieve a constant weight of drying whereas drying time for 30 US-E samples were 275, 225 and 175 min, indicating 30 US-E reduced the total drying time by 26.66, 30.77 and 22.22% at 60, 70 and 80 °C respectively. The values obtained for effective moisture diffusivity (Deff) ranged from  $1.98 \times 10^{-8}$  to  $4.08 \times 10^{-8}$  m<sup>2</sup>/s. The activation energy values were found to be 23.43, 21.35, 16.76 and 12.58 kJ/mol with R<sup>2</sup> values (0.9952, 0.9991, 0.999 and 0.9800) for Control, 10, 20 and 30 US-E pretreatment duration samples respectively. Color (L\*, a\*, b\*) and texture were affected significantly (p < 0.05) at high temperature and longer US-E. Shorter US-E duration and lower temperature could preserve most functional groups. Also, total free amino acid values were significantly higher at lower temperature and longer US-E pretreatment.

**Keywords:** Pulsed Vacuum, Drying Kinetics, Fourier Transform Infrared Spectroscopy, Free Amino Acid, Activation Energy, Moisture Effective Diffusivity, Ultrasonication

Harmanjot Singh  
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ERCICSTR2002067

Comparison between Hierarchical and Graph Clustering method

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Daljit Singh

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**Abstract**

Every organization deals with a large amount of data every day and the problem of grouping the data in an efficient manner is becoming today's big problem. Clustering is considered as the best method to organize such type of large databases. Clustering helps to group a large database into several subgroups which can be easily maintained, more understand and accurate. There are several clustering methods which can be used. But it is difficult to decide which method groups the data into an efficient, accurate and quick manner. The good clustering results in better organization of data. Since there are many different methods of clustering are possible like hierarchical method, grid-based method, density-based method, partitioned method, graph clustering method and so on. This paper proposes a solution to choose a better clustering method from hierarchical and graph-based clustering on the basis of quality of the clusters. To evaluate the quality of clusters, three parameters are taken as: cohesion, mean square error and time taken to decide which method is better. Based on the results of these two parameters, it can be decided that which method creates the good quality clusters in lesser time.

**Keywords**—clustering; hierarchical clustering; graph-based clustering; quality; cohesion; mean square error; time taken.



Ampofo Godfred  
ERCICSTR2002069

Information Technology and Systems

Ampofo Godfred

Nanjing University of Posts and Telecommunications Master Degree in Information Communication  
Engineering

**Abstract**

Information technology (IT) has the potential to continue to dramatically transform how we work and live. One might expect that future IT advances will occur as a natural continuation of the stunning advances that IT has enabled over the last half-century, but reality is more sobering. IT advances of the last half-century have depended critically on the rapid growth of single-processor performance—by a factor of 10,000 in just the last 2 decades—at ever-decreasing cost and with manageable increases



in power consumption. That growth stemmed from increasing the number and speed of transistors on a processor chip by reducing their size and—with improvements in memory, storage, and networking capacities—resulted in ever more capable computer systems. It has for a while been widely accepted that an appropriate mathematical model for studying data types is the category of domains, i.e. consistently complete algebraic cpos, and continuous functions. What has not fared as well in acceptance is a method of representation, or implementation, of domains. The most recent method of representation—Information Systems—was introduced by Dana Scott and is gaining acceptance, as indicated by its appearance in a number papers. The morphisms utilized in the study of information systems are approximable mappings and they correspond to continuous functions when one passes from an information system to the domain which it implements. This conference would advance my ideas on information systems that would benefit my projects into the unforeseeable future.  
**Keywords: Information; Consumption; Morphisms; Implementation**

Dr. Shailesh Mishra  
ERCICSTR2002071

**Solid Waste Management & Organizational Transformation**

Dr. Shailesh Mishra  
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**Abstract**

A Real Time project aims to highlight the facts that a small proposal with better inventiveness can be a role model for an enhanced society.  
We are trying to create awareness and sensitizing the mankind on responsible disposal of Food, Stationary, Papers & Green Waste and good practices for recycling by partnering with responsible organizations.  
Note: It's just a concise presentation entails the Objective and ROI of this project. A detailed project report can be presented on if needed.



Abarna J  
ERCICSTR2002077

**Modeling of Three Phase Induction Motor with Dtc Drive Fault Analysis Using Fuzzy Logic**

Abarna J  
Assistant Professor, Department of Electronics and Instrumentation Engineering, Bannari Amman Institute of Technology, Tamil Nadu

**Abstract**

Three phase induction motor drives are the most widely used drives in heavy load industries Because of its wide usage in industry, a small fault occurring in the motor drive may cause huge damage and results in failure of heavy machineries. In order to avoid these failures, all the possible faults that may occur in induction motors are analysed. Based on the analysis performed, the parameters that may cause faults in the drive system are monitored. Even a minute change in the parameters are monitored using an intelligent control method named Fuzzy based monitoring system. In this monitoring system, induction motor drive is adopted with a direct torque control method to avoid the usual torque ripples present in the system. This intelligent fault monitoring system is used to take corrective measures within a specified time when the drive is implemented in an electric vehicle applications.  
**Keywords: Induction Motor, Faults, DTC Drive, Space Vector PWM, Hysteresis Controller, Fuzzy Monitoring System**

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