

## **2014 BOSI EDU MALAYSIA CONFERENCE SCHEDULE**

**2014 2<sup>nd</sup> International Conference on Mechanical  
Structures and Smart Materials**

**(2nd ICMSSM 2014)**

**2014 the 2nd International Conference on Applied  
Mechatronics and Android Robotics (ICAMAR2014)**

**2014 International conference on Electrical Engineering  
and Architectural Engineering(ICEEAE2014)**



**ICMSSM 2014**

**Kuala Lumpur, Malaysia**

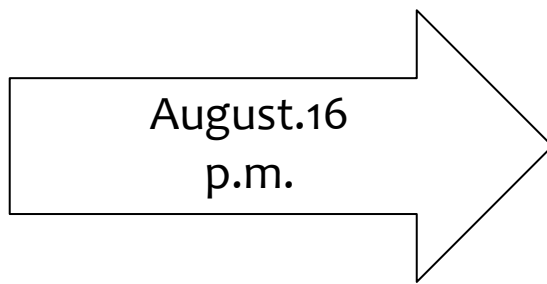
**August.16-17, 2014**

**<http://www.icmssm.org/>**

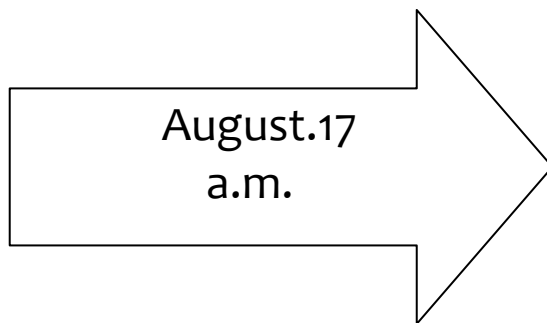
**SPONSORED BY**



## Simple Version of the Schedule



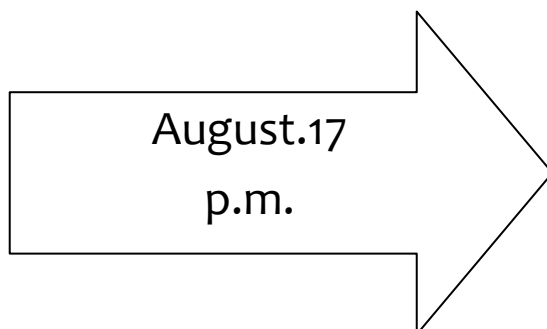
Registration at the  
Furama Bukit Bintang Hotel  
Kuala Lumpur (14:30-17:00)



- Plenary Speech 1(9:00-9:30)
- Plenary Speech 2(9:30-10:00)
- Plenary Speech 3(10:00-10:30)
- Coffee Break (10:30-10:45)
- Oral Presentation (10:45-12:00)

Session 1

- Lunch (12:00-13:00)



- Oral Presentation (13:00-15:00)

Session 2

- Coffee Break (15:00-15:15)
- Oral Presentation(15:15-17:00)

Session 3

## **Committees**

### **Editorial Chair**

ASSOC. PROF. DR. SALMAH HUSSEINSYAH, Universiti Malaysia Perlis  
(UniMAP)

### **Conference Chair**

Jenny Ji, BOSI Education & Consultancy, China

### **International Committee**

#### **Malaysia:**

Dr.Chong Wen Tong, University of Malaya, Malaysia

Dr.Ching Yern Chee, University of Malaya, Malaysia

Dr.Nik Hisyamudin Muhd Nor, Universiti Tun Hussein Onn Malaysia, Malaysia

#### **China:**

Pak Kin WONG, University of Macau, Macau, China

Prof. Qingsong Xu, University of Macau, Macau, China

Prof. Ka-Veng YUEN, University of Macau, Macau, China

#### **South Korea:**

Prof. Sung-Hoon AHN, Seoul National University, South Korea

#### **Canada:**

Assistant Pro. Dr. M. Shahria Alam, The University of British Columbia,  
Canada

#### **India:**

Geetesh Goga, K.C. College of Engineering and I.T.Nawanshahr (Punajb),  
India

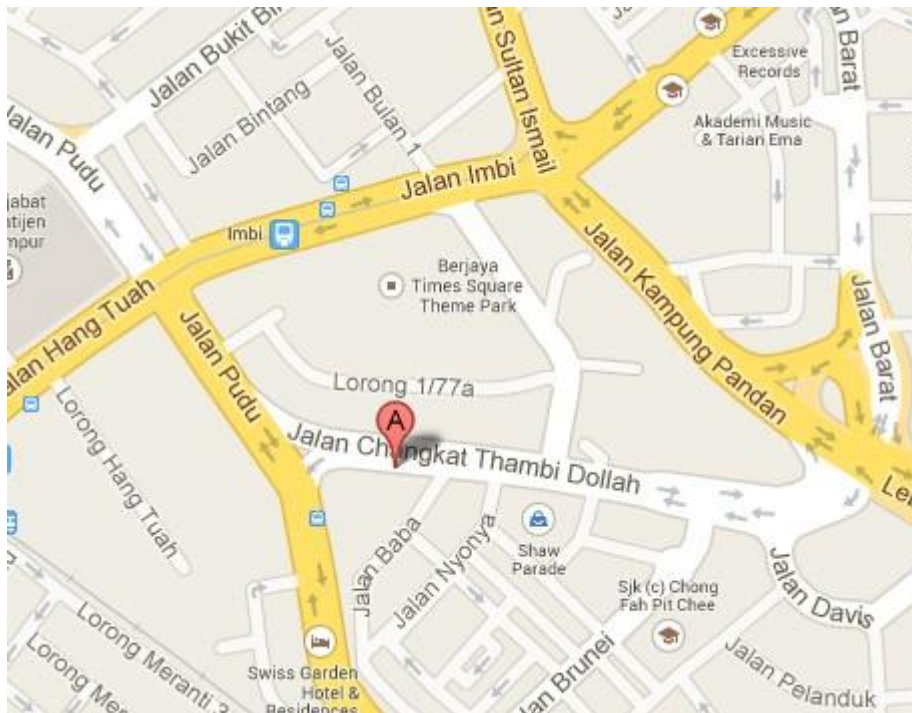
## Venue

**Conference venue:** Furama Bukit Bintang Hotel Kuala Lumpur(吉隆坡富丽华武吉免登酒店)

Add: 136, Jalan Changkat Thambi Dollah, 55100 Kuala Lumpur, Malaysia



**Map to Furama Bukit Bintang Hotel Kuala Lumpur for Reference**



## Conference Schedule

<b>August 16, 2014(Saturday)</b>	
<b>14:30-17:00</b>	<b>Registration at the lobby of Furama Bukit Bintang Hotel Kuala Lumpur</b>

Note: You can also register at any time during the conference.

<b>August 17, 2014 (Sunday) Saffron IV, Level 27</b>	
<b>9:00-9: 30</b>	<b>Plenary Speech 1 Professor Geetesh Goga</b>
<b>9:30—10:00</b>	<b>Plenary Speech 2 Professor M. Shahria Alam</b>
<b>10:00—10:30</b>	<b>Plenary Speech 3 Dr. Ching Yern Chee</b>
<b>10:30—10:45</b>	<b>Photos &amp;Coffee Break</b>
<b>10:45—12:00</b>	<b>Session 1</b>
<b>12:00-13:00</b>	<b>Lunch At Spices, Level 3.</b>
<b>13:00—15:00</b>	<b>Session 2</b>
<b>15:00—15:15</b>	<b>Coffee Break</b>
<b>15:15—17:00</b>	<b>Session 3</b>

### Note:

1. All the participants are strongly advised to arrive before **8:50, August, 17, 2014**.
2. Certificate of Participation can be collected at the registration counter.
3. Please copy PPT files of your presentation to the secretary when registration.
4. The organizer doesn't provide accommodation, and we suggest you make an early reservation.
5. If you want to deliver oral presentation but your paper is not in the session list, please contact us by Email: [cfp@icmssm.org](mailto:cfp@icmssm.org) (for ICMSSM2014)

## Instruction about Oral Presentation

### Devices Provided by the Conference Organizer:

- Laptops
- Projectors & Screen
- Laser Sticks

### Materials Provided by the Presenters:

- PowerPoint or PDF files
- Duration of each Presentation:  
Regular Oral Session: about 8-10 Minutes of Presentation and 5 Minutes of Q&A

## Plenary Speech

### Plenary Speech 1 9: 00-9: 30

**Professor Geetesh Goga.**

**Organization:** K.C. College of Engineering and I.T., Nawanshahr, Punjab, India

**Profile of Keynote Speaker:** For the past Eight years, Prof. Geetesh Goga is Dean (Academics) of K.C. College of Engineering and I.T. He has been involved in research in field of Mechanical Engineering from past many years. He has won the best paper presentation award in conference held in Dubai, UAE in October 2012. He has so many research papers in International Journals and Conferences. He is a winner of many other awards and scholarships, and his research contribution has been recognized by various professional bodies and institutions. He is also editor of many research journals. He has also organized many Faculty Development Programs and Conferences.

### Plenary Speech 2 9: 30-10: 00

**Professor M. Shahria Alam**

**Organization:** The University of British Columbia, Canada

**Profile of Keynote Speaker:** Dr. Shahria Alam is an Assistant Professor in the School of Engineering at The University of British Columbia's Okanagan campus. He received his PhD in Civil Engineering from Western University in 2008. His research interests include smart materials and their structural applications in bridges and buildings; seismic isolation devices, seismic rehabilitation of structures; performance-based design; recycle/reuse of industrial wastes. Dr. Alam has published more than 40 peer reviewed journal papers and 40 conference papers in these topics and is the recipient of many national and international awards. This year he received the Moldovan Memorial Award for his research contribution in innovative green technology. This year one of his journal papers has been selected as one of the top journal papers published in the 2013 Smart Materials and Structures, IOP journal and is presented in 'Highlights of 2013'. Currently Dr. Alam is serving as the Chair of the Concrete Structures Sub-Committee of the Canadian Society for Civil Engineering (CSCE). He also serves in various international code committees.

Plenary Speech 3 10:00-10:30

**Dr. Ching Yern Chee**

**Organization:** University of Malaya, MALAYSIA

**Profile of Keynote Speaker:** Dr. Ching Yern Chee graduated from the Faculty of Chemical Engineering, University Technology Malaysia. She obtained her M.Eng. in Polymer Engineering from the same university. Dr. Ching obtained her DOCTOR OF PHILOSOPHY in Mechanical Engineering in 2011 from the University of Malaya. Dr. Ching joined UM in 2011 as a Senior Lecturer (Department of Mechanical Engineering), after spending 7 years in various polymer and composite processing industries. Her research focus is polymer composite, biopolymer, nanocomposite coating & biobased nanomaterials; and she has secured more RM 2 million research grants as project leader. She filed >2 intellectual property rights. Her research invention (Biobased nanocomposite coating system) has won the Gold Medal in MTE 2013 and ITEX 2013. Dr. Ching serves as reviewer for several SCI-Q1 journals. She participates actively in the administration works in UM and involves in several professional bodies. She also contributed to the development of Malaysian Standards on Dependability Management (SIRIM). She is a Chartered Engineer of IMechE, UK, Graduate Engineer of Institute of Materials, Minerals and Mining, UK. Graduate Engineer of Board of Engineers, Malaysia and member of the Institution of Engineers, Malaysia (IEM).



10:15-10:30

Group Photo & Coffee Break



## Session List

### Session 1

August 17, 2014(10:45-12:00)

#### Session Chair

**Associate Professor Dr. Supakorn Pukird**

**Organization :Ubon Ratchathani University, Thailand**

#### 1-Paper ID: 16

**Title:** Incremental Dynamic Analysis of Shape Memory Alloy Braced Steel Frames

**Authors:** Saber Moradi,M. Shahria Alam

**Abstract:**Incremental Dynamic Analysis (IDA) is a technique to determine the overall seismic performance of structures under varied intensities of earthquakes. In this paper, the seismic performance of four-story steel braced frames equipped with superelastic Shape Memory Alloy (SMA) braces is assessed by performing IDA. The seismic response of SMA-braced frames was compared to that of corresponding Buckling-Restrained Braced Frames (BRBFs). Based on the results of this comparative study, the SMA-braced frames were generally effective in reducing maximum interstory drifts and permanent roof deformations. In addition, the SMA-braced frames demonstrated more uniform drift distribution over the height of the building. As the intensity of earthquake excitation increases, a higher response reduction can be expected for SMA-braced frames.

#### 2-Paper ID: T18

**Title:** Time-temperature effect for preparation of SnO<sub>2</sub> nanostructures using carbon assisted

**Authors:** Dheerachai Polsongkram, Pattanasuk Chamninok, Suchaowadee Changsakul, Atipong Sriputhorn and Supakorn Pukird

**Abstract:** We studied the effect of time and temperature for preparation of SnO<sub>2</sub> nanostructures by chemical vapor deposit methods. SnO<sub>2</sub> nanostructures were synthesized using Sn powder with carbon charcoal as starting materials. The source materials and Si substrates were heated with various times, temperatures under atmosphere of nitrogen and oxygen. The synthesized products were characterized using scanning electron microscopy (SEM), X-ray diffraction (XRD) techniques. The results showed the nanostructures of prepared products were very uniformly of SnO<sub>2</sub> nanowires with diameter about 100-300 nm and length around more 1-2 μm depending on times and temperatures.

**3-Paper ID: M360**

**Title:** Watermelon rind: A Potential Adsorbent for zinc removal

**Authors:** N.Othman, Y. S. Kueh, F.H. Azizul-Rahman, R. Hamdan

**Abstract:** The industrial revolution has significantly increase the discharge of wastewater into water bodies with heavy metals. In this study, watermelon rind was used as a biosorbent. Wastewater from mosaic industry was characterized by using flame AAS and zinc was found to have concentration range of 350mg/L to 450mg/L. Watermelon rind was characterized by using XRF and SEM. The results from XRF before biosorption shows the presence of Si to enhance biosorption. Zinc present after biosorption. The optimum pH, biosorbent amount, zinc concentration and contact time were found to be pH8, 1.5g, 400mg/L, and 30minutes respectively. The watermelon rind was proven as an effective biosorbent for zinc removal from aqueous solution.

**4-Paper ID: 6**

**Title:** Grain and Feature Size Effect On Material Behavior For Micro-Sheet-Forming

**Authors:** Mohd Azam Musa, Akhtar Razul Razali, Nazrul Idzham Kasim

**Abstract:** Negligible factors in bulk materials, such as grain-size effects, have proven inappropriate to be neglected for micro-forming processes. Studies had shown that material behavior varies greatly with the increasing of the scale in the micro-forming world. Therefore, in every micro-forming-related process, especially in micro-stamping, studies and analyses of each material used for the process have to be considered as indispensable in order to be able to understand their behavior and to be able to correlate their behavior with the process. Uniaxial tensile-testing experiments have been carried out to determine the strip's properties, behavior and its correlation with the feeding process in micro-stamping/micro-sheet-forming application. Based on the results of the uniaxial tensile-test experiments conducted, the flow stress was found to decrease with the decrease of the strip thickness and vice versa, due to the size/scale effect. A surface model was used to explain the findings.

**5-Paper ID: 10**

**Title:** Tensile Properties of Semi-Solid Die Cast AC4C Aluminum Alloy

**Authors:** Keren Shi, Sirikul Wisutmethangoon, Jessada Wannasin and Thawatchai Plookphol

**Abstract:** In this study, semi-solid Al-Mg-Si alloy (AC4C) was produced by using the Gas Induced Semi-Solid (GISS) die casting process. The tensile strength and ductility of the semi-solid die cast Al alloy (GISS-DC) after T6 heat treatment were investigated and compared with those of the conventional liquid die casting (CLDC). The microstructures of GISS-DC and CLDC observed by an optical microscopy were presented. The ultimate tensile strength (UTS) and yield strength (0.2% YS) of GISS-DC are compatible with those of the CLDC. However, the GISS-DC has better ductility than the CLDC, this may be due to the smaller and more globular primary  $\alpha$ -Al phase and rounder shaped-Si particle microstructures presented in the GISS-DC. Common shrinkage pores and defects were also observed by SEM from the fracture surfaces of both alloys.

**6- Paper ID: 14**

**Title:** Shape Memory Alloy (SMA) Applications in Bone Fixation: A Review

**Authors:** Mohd Roshdi Hassan, Yong Tian Haw

**Abstract:** Shape Memory Alloy (SMA) can transform its shape back to its original shape when subjected to a thermomechanical process. Applications of SMA in the bone fixation have been successful due to the material's ability to exhibit Shape Memory Effect (SME) as well as biocompatibility. A good design of bone fixation device made of SMA is capable of exerting a constant compressive force to the bone fracture while remains inert to the environment inside the host's body. This study reviews the application of SMA in bone fixation devices. These include SMA suturing devices, Acetabular Tridimensional Memory Alloy-Fixation System (ATMFS), OSStaple, SMA patellar concentrator and SMA embracing fixator.

**7- Paper ID: M361**

**Title:** Zinc removal using Honey dew rind

**Authors:** N.Othman<sup>\*</sup>, A.S.Che-Azhar, A.Suhaimi

**Abstract:** Heavy metals pollution in wastewater from agriculture and industrial waste has been a great concern due to their toxic condition and adverse effect to the environment and human life. One of the treatment of heavy metals through biosorption. In this study, zinc is the highest concentration heavy metal in mosaics wastewater with 350 - 450 mg/L and thus, it has been selected for further study for heavy metals removal. Honeydew rind was used as biosorbent material to remove zinc in the wastewater. Characterization and optimization study were carried out. The optimum condition for pH, biosorbent amount, concentration of wastewater and contact time are at pH 6, 1.5g adsorbent, 400 mg/L zinc and 30 minutes contact time respectively 63% zic removal. This finding indicates that honeydew rind is effectively acted as biosorbent in biosorption process for removing zinc from wastewater.

**8- Paper ID: 34****Title:** Properties of Special Mortar Made with Raw Waste Material**Authors:** Mohd Syahrul Hisyam Mohd Sani, Fadlulhartini Muftah, Muhammad Isha Ismail, Marzuki Ab. Rahman

**Abstract:** The paper deals with the properties of a special mortar using a Waste Paper Sludge Ash (WPSA) from Waste Paper Recycling Industry and Bottom Ash (BA) from Coal Electric Power Stations. Special mortar with some advantages is proposed to give a significant impact for replacing of normal cement mortar. The advantages are approached due to the problem that occurred from collecting raw material such as pollution problems and environmental impact issues. Besides, the raw material sources of cement and sand is limited and this issue engages with the ideas to produce new material in mortar and masonry engineering. A total 72 cubes mortar is cast and determined their properties of chemical and mechanical. The properties of special mortar are compared with other special mortar made of other waste material. The compression strength of special mortar is conducted at the age 3, 7, 28 and 40 days of curing. From the result of chemical properties, it showed that the special mortar created the high compression strength value for all mixes. The compression strength of special mortar is increased by increasing the percentage sand replacement by BA. But, the compression strength is decreased when WPSA is increased. Finally, the special mortar with 100 % BA and 10 % WPSA showed the appropriate proportion for producing special mortar.

12:00-13:00

Lunch

**Session 2**

**August 17, 2014(13:00-15:00)**

**1- Paper ID: M358**

**Title:** Failure Analysis of Composite Laminates Under Biaxial Loadi : A Review and Framework

**Authors:** MUHAMAD IRWAN Mohd Din, ZURRI ADAM Mohd Adnan, JAMALUDDIN Mahmud<sup>1,c</sup>

**Abstract:** The designing of composite structures for modern and precision application is complicated due to its anisotropic and inhomogeneous material behaviour. Therefore, reliable methodology for fully predicting the performance of composite structures must be developed. Hence, analytical and numerical solution will be implemented in order to perform failure analysis of composite laminates under biaxial loading. There are many approaches developed in order to study the failure behaviour of composites materials. This paper reviews and proposes a research framework that employs analytical method, numerical method using MATLAB programming and finite element method using ANSYS 14.0 to investigate the failure behaviour of composite structures. The First Ply Failure (FPF) and Last Ply Failure (LPF) analysis will be performed to determine the failure curves. Finally, the failure curves obtained from both analytical and finite element simulation will be compared with results published from previous experiments.

**2- Paper ID: M303**

**Title:** Takeoff Performance Analysis Based on Aeroengine EGT Trend Monitoring and Control

**Authors:** Fu Qiang, Fan Ding

**Abstract:** Exhaust gas temperature(EGT) is an important parameter for aeroengine. By monitoring the change in trend, can effectively predict the engine take-off performance. The characteristics of takeoff EGT were introduced firstly. Two methods of estimating takeoff performance were analyzed subsequently. According to the statistical data, EGT can be used for takeoff performance prediction.

**3- Paper ID: 37**

**Title:** A Brief Review And Framework Towards Synthesising Silicone-Hydrogel Materials That Mimics Skin Deformation Behaviour

**Authors:** Nurul Nadiah Azmi, Ilya Izyan Shahrul Azhar, Jamaluddin Mahmud

**Abstract:** Skin is an important organ which provides multiple functions. Thus, if skin fails i.e. due to burns or diseases, body will lose the protection provided by skin against infections and the harmful outer environment. Due to that, synthetic skin is seen as a very important alternative in the future. A number of studies have been carried out to understand skin's basic functions and behaviour as its mechanical properties and behaviour are important in various fields. Nevertheless, to date no breakthrough has been reported. Therefore, this paper aims to briefly review and outline a framework which ultimately will lead to the synthesising silicone-hydrogel materials that potentially becoming a skin substitute. The newly synthesised composite materials will be tested mechanically to characterise its behaviour based on Ogden hyperelastic model. It could be emphasised that the present study is significant and will contribute to the body of knowledge in the area of skin mechanics.

**4- Paper ID: 45**

**Title:** An experimental study on the cutting forces, surface roughness and the hardness of Al 6061 in 1D and 2D ultrasonic assisted turning

**Authors:** Reza Nosouhi, Saeed Behbahani, Saeed Amini, Mohammad Reza Khosrojerdi

**Abstract:** The machinability of Al 6061 in 1D and 2D ultrasonic assisted turning (UAT) in terms of machining forces, surface roughness and hardness is investigated in this research. In order to perform the machining experiments, a 1D vibration tool and a 2D vibration tool are designed and manufactured. The cutting forces and surface roughness of the work-pieces in 1D UAT and 2D UAT are measured in different cutting speeds and feed rates and compared with that in conventional machining. To investigate the effect of the ultrasonic vibration on the material properties, hardness tests are performed on the work-piece material and micro-hardness tests are carried out on the chip specimens. The results showed that reduction in the cutting forces occurred in UAT. The results also showed that the surface roughness is exceeded in UAT in comparison with the conventional machining. While no detectable effect of the ultrasonic vibration on the work-piece material could be observed, the chip micro-hardness experiments showed that the softening phenomenon occurred in UAT, which can be the cause of the force reduction in UAT.

### 5- Paper ID: 43

**Title:** A Framework for Experimental-Numerical Analysis of Woven Laminates Failure

**Authors:** MOHD ZAIRIL HAFIZI Mohd Zailani, MUHAMAD IRWAN Mohd Din, ZURRI ADAM Mohd Adnan, JAMALUDDIN Mahmud

**Abstract:** Woven composite laminates have been widely used in various application and rapidly replacing unidirectional composite laminates. Thus, it is vital to understand clearly their material parameters and characteristic. Apparently, it is very difficult to analyse the design parameters of a unidirectional composite laminate, and thus due to its weaving structure, analysing numerically the parameters of a woven composite laminate is even more difficult. Therefore, this paper aims to review the work related to woven laminates with respect to its testing and simulations. During the initial stage, a tensile test is conducted according to ASTM D3039 on the 2x2 twill weave carbon fibre woven prepreg where the material constants ( $E_1$ ,  $E_2$ ,  $G_{12}$  and  $\nu_{12}$ ) and the deformation behaviour will be obtained. The later stage will involve the development of a finite element modelling and simulation by means of commercial finite element package ANSYS 14.0 to replicate the experimental set-up. Ultimately, the outcomes and findings between the experimental and numerical approaches will be compared and reported.

### 6- Paper ID: 30

**Title:** Preliminary Numerical Analysis of a Platform Structure

**Authors:** Asrul Khairi Sohaimi, Anwar P.P. Abdul Majeed and Jamaluddin Mahmud

**Abstract:** Finite element analysis (FEA) has become an increasingly important tool in evaluating structural performance of platforms. This includes the use of this tool to perform strength, stability checks, optimisation of structural design upon subjected to design loads as well as to perform failure investigation of platforms upon subjected to special loading conditions such as impacts. Traditionally, small and medium enterprises utilises laboratory (physical) testing and heuristic experience to fabricate and test the platforms, nonetheless this approach is deemed too time consuming and cost demanding. Therefore, this study aims at reconstructing the actual design based on engineering drawings as well as performing stress analysis by means of a commercial FEA

software package, ANSYS v14.0 by investigating the effects of two distinct loading impacts on a mild steel platform. The maximum stress and maximum displacement values obtained via the FEA simulation was then compared with values obtained via theoretical computation. The results obtained via the FEA simulation was found to be in good agreement with the exact solution. The present study is non-trivial as it contributes towards the knowledge in the design and optimisation of complex steel structures.

**7- Paper ID: 27**

**Title:** Buckling of Functionally Graded Pipes Under Hydrostatic Pressure

**Authors:** B. Mirzavand and Sh. Dalvand

**Abstract:** Functionally graded pipe is an effective design alternative, providing effective buckling strength, thermal stress resistance, and corrosion resistance, to pipelines, especially for deep-water applications. This article presents elastic buckling analysis of functionally graded pipes under hydrostatic pressure. Derivation of equations is based on classical shell theory using the Sanders nonlinear kinematic relations. The novelty of the present work is to obtain closed form solutions for critical buckling loads of the FGM pipes under hydrostatic pressure, which are convenient to be used in engineering design applications.

**8- Paper ID: M363**

**Title:** Experimental Investigation on Compression and Chemical Properties of Aluminium Nano Composite

**Authors:** B. Vijaya Ramnath, C. Parswajinan, C. Elanchezian, S. V. Pragadeesh, C. Kavin, P. R. Ramkishore, V. Sabarish

**Abstract:** Aluminium metal matrix composites are being widely investigated with Carbon Nanotubes (CNTs) as one of their reinforcing agents. This is done in order to improve the mechanical strength of the composite. Various studies on this concept have already been recorded. In this study, Aluminium has been reinforced with CNTs using powder metallurgy technique. The powders of aluminium and CNT are ball milled, compacted in a die made up of die steel, and then sintered. The specimens thus obtained were subjected to hardness, compression and chemical tests and the values were compared with pure aluminium specimen fabricated by same technique. The study indicated that there was no improvement in hardness of the composite on addition of CNT. The compressive strength of the composite was increased by 143.58 MPa. The microstructure of pure aluminium and Al-CNT composite had fine grains of pure aluminium particles and Al-Si eutectic particles throughout the matrix phase.

**9- Paper ID: M302**

**Title:** Kinematics Modelling and Simulation of Aero-engine Fuel Piston Pump

**Authors:** Jiang-feng Fu, Hua-cong Li, Jia Li, Shu-hong Wang

**Abstract:** Kinematics parameters calculation is the basis of piston pump design and performance analysis. Taking an axial piston pump with incline piston and spherical swash plate as the research object, Aimed at the deficiency of current formula for calculating piston pump kinematics parameters which included displacement, velocity and acceleration. In this paper, according to piston pump part motion geometry relationship, a correction kinematics algorithm is deduced by using the spherical coordinate and cartesian coordinate transformation method, the analyse method and deduction procedure ensure the new calculating formula are precise in theory.

Applying the calculating formula to an aero engine fuel axial piston pump, results show that. The displacement, velocity, acceleration according to the kinematics principle of piston pump, it can be used in the kind of piston pump kinematics parameters calculation and current calculating method evaluation.

**10- Paper ID:** M301

**Title:** A Design Method of Aero Fuel Centrifugal Pump with Integrated Inducer and Impeller

**Authors:** Jia Li, Hua-cong Li, Jiang-feng Fu, Shu-hong Wang

**Abstract:** With the development of the aero engine control technique, aero fuel centrifugal pump with integrated inducer and impeller meet the requirements better than the divided pump. This paper established the hybrid network of the centrifugal pump which adopted multi-block topology structure and octree format, analyzed the internal flow field performance of the pump based on numerical simulation. The simulation datas compared with test datas show that under different calculation conditions, head error of the simulation data and experimental data is less than 1%, and the efficiency value of error is less than 5%. The simulation method can accurately calculate the performance of the pump. The simulation analysis shows that the asymmetry of the impeller internal pressure is appreciable under different flow conditions because of the inlet length, under other small flow conditions. The most dramatic change is the pressure in the impeller channel, and the pressure under large flow conditions is lower than that under other flow conditions. In fixed location of the pressure side, there may produce low speed flow group, the situation is the same as in the entrance to the attachment of back pressure side.

**11- Paper ID:** 16(ICAMAR)

**Title:** Error Compensation based on Lagrange Multiplier in Heterodyne Laser Interferometer

**Authors:** Eun-Hwan OH, Woo-Ram LEE, Kyung-Hyun LEE, Kwan-Ho YOU

**Abstract:** In this paper, we propose a signal compensation algorithm. In heterodyne laser interferometer, the unexpected error restricts the precision such as nonlinearity and environmental error. To improve the accuracy in length measurement, we use the method of Lagrange multiplier which solves the constrained optimization problem and allows to minimize an objective function. With the method of Lagrange, we apply it to a length measurement and show the result of simulation.



15:00-15:15

Coffer Break



**Session 3**

**August.17, 2014(15:15-17:00)**

**Session Chair**

**Associate Professor Recai KUS**

**Organization : Selcuk Univeristy Konya,TURKEY**

**1- Paper ID: 22(ICAMAR)**

**Title:** The Study on the Cathodic Protection Effect of the ICCP Anodes with Exposed Conditions

**Authors:** Jin-A Jeong, Chung-Kuk Jin

**Abstract:** This paper presents the results of the effects of anodes for impressed current cathodic protection (ICCP) system on reinforced concrete. Experimental tests were carried out on reinforced concrete specimens with 3 different kinds of commercial anodes that are used for ICCP in order for comparative study. Results have shown that the type of anodes is irrelevant to the effectiveness of cathodic protection. CP current similarly flowed to the anodes regardless of anode types in seawater condition. In addition, current was much higher in seawater condition than freshwater and air condition. The results show that titanium rod anode was slightly more effective in fresh water, and titanium mesh anode showed a better performance in atmospheric condition. The potential drop caused by concrete resistance in atmospheric condition should be considered at depolarization potential measurement.

**2- Paper ID: M380**

**Title:** Investigation on Compression and Hardness Properties of Abaca and Manila Hybrid Composite

**Authors:** Manickavasagam.V.M, Vijaya Ramnath. B, Elanchezhian.C,Vignesh. V,Vijai Rahul. V, Sathya Narayanan S.U,Tamilselvan .V

**Abstract:** Nowadays composite materials play a vital role in automotive and aerospace industries due to their important properties like high strength to weight ratio, biodegradability and ease of production. In this paper, compression and hardness properties of a hybrid composite made of manila and abaca fibers are evaluated. Hand layup process is used in this work. The result shows that hybrid composite possesses very high strength and hardness as compared to mono fibre composite.

**3-Paper ID: M381**

**Title:** Simulation and Experimental investigation of Springback in Air V- Bending Process Using Finite Element Method (FEM)

**Authors:** Muhamad Sani Buang , Shahrul Azam Abdullah and Juri Saedon

**Abstract:** This paper presents an investigation on cold bending process using simulation and experimental study. The experimental and simulation were performed on stainless steel 304 sheet

metal in air V-bending. The factors involved in the process are punch radius, die radius, die gap, punch travel and punch velocity. The aim of this paper is to investigate the factors that affect the springback behavior of stainless steel in air V-bending using Finite Element Method (FEM) software Simufact-Forming™ version and material database MatILDa. The simulation parameters followed the actual setting under consideration of the machine characteristic and friction. The simufact.forming™ simulation was further verified using hydraulic press machine which determine the desired speed of the forming punch. As the final result, comparison effect of springback between simulation and experiment is presented. The simulated data from simufact.forming™ are in good agreement with experimental.

**4-Paper ID: 21****Title:** Measurement System Analysis of VS Lite**Authors:** Ghazirah Mustapha, M Saiful Aizat Shafie, Nur Hayati M Yahaya and Jamaluddin Mahmud

**Abstract:** Virtual Sensei Lite (VS Lite) is an inexpensive user-friendly motion analysis system. As an alternative motion capture system, it is a must for VS Lite's user to assess the accuracy of the measurement system capability. To date, such analysis to observe the reliability and accuracy of VS Lite has not been reported. Therefore, this study proposes a procedure for assessing the accuracy and capability of the Virtual Sensei Lite using ANOVA Gage Repeatability and Reproducibility (Gage R&R) designed experiments. In this procedure, a gage R&R study is conducted to obtain replicate measurements on nine parts by three operators. The total variation due to measurement error is then observed to identify the accuracy of measurement. The study able to demonstrate on the accuracy of VS Lite as the value of total variation due to measurement error is within 10%-30%.

**5-Paper ID: M382****Title:** Analysis of Mechanical Properties Between Sugarcane Bagasse/LDPE Composites versus Coconut Coir Wax/LDPE Hybrid Composites**Authors:** Kannan Rassiah, Paramanathan Balakrishnan, Kamal Haron

**Abstract:** Development of new natural fiber composite for a good characteristic is the focus of many studies, because of their cellulose contents make their properties more potential. However, the main challenge in the research on natural fiber/ polymer composites is their poor compatibility. Based on that, the comparison study by chemical treatment of sodium hydroxide (NaOH) method and adding wax has been explored in two different processes to improve the compatibility of the natural fiber surface. The sodium hydroxide (NaOH) treated sugarcane bagasse (SCB) and coconut coir wax (CCW) in low density polyethylene (LDPE) as a reinforced matrix in fact, will enhance the mechanical properties of the resulting composites. In this study, four different compositions of (90/2, 90/4, 90/6, 90/8), with additional of 2% of NaOH and 2-8 % wax with sugarcane bagasse (SCB) / coconut coir respectively were tested. The specimens were analyzed by different techniques such as tensile test, hardness test, impact test and scanning electron microscopy (SEM) according to ASTM standard. This research has shown that the presence of NaOH indicates higher tensile strength and impact strength compared to coconut coir wax (CCW). While for the young modulus and hardness test value shows coconut coir wax (CCW) has increased and improved. The

morphological analysis was conducted to determine the effects of natural fiber bonding between the matrix materials for broken specimens after mechanical testing.

**6-Paper ID: 23**

**Title:** Kinematics and Efficacy Analysis of the Seni Silat Cekak Malaysia (Kaedah A)

**Authors:** Ghazirah Mustapha, Wan Ruzaini Wan Sulaiman, Anwar P.P. Abdul Majeed, Nur Hayati Mohd Yahya and Jamaluddin Mahmud

**Abstract:** Kaedah A is a fend off technique engaged in Seni Silat Cekak Malaysia, upon confronting a punch force exerted within the vicinity of the thorax area. Hitherto, there is still lack of biomechanical analysis on the execution of Kaedah A. Therefore, this study aims at analysing the effectiveness of Kaedah A based on the total execution time as well as to describe the kinematic characteristics of the hand movement upon its execution. The experiment was carried out by means of motion capture. Microsoft Kinect was utilised to detect the hand movement whilst the post processing of the captured motion was performed via Virtual Sensei Lite. Kaedah A was executed five times by an experienced Seni Silat Cekak Malaysia practitioner to investigate the accuracy and repeatability of the system. The data obtained serves as an input for the trajectory mapping for both initial and end point identification. The time difference,  $\Delta t$  between the points demonstrates that the total time execution for Kaedah A is less than 0.1 s. Further analysis involves filtering the coordinate data obtained in order to generate the polynomial function of the hand movement during the execution of Kaedah A. It could be concluded that the Kaedah A execution has the features of a ballistic movement. The findings provides useful data for reliability prediction as well as further enhancement of the Kaedah A itself.

**7-Paper ID: 26**

**Title:** Buckling of Axially Loaded Piezoelectric-FGM Cylindrical Shells on Winkler Elastic Foundation

**Authors:** B. Mirzavand , F. Rashidi ,Sh. Dalvand

**Abstract:** A buckling analysis is presented for functionally graded cylindrical shells that are integrated with surface-bonded piezoelectric actuators resting on Winkler type elastic foundation and are subjected to the combined action of compressive axial load and constant applied actuator voltage. The material properties of the functionally graded substrate are assumed to vary as a power form of the thickness coordinate. Derivation of the equations is based on the classical shell theory. Results for the critical buckling loads are obtained in closed form. The effects of the elastic foundation, applied actuator voltage, shell geometry, and volume fraction exponent of functionally graded material on the buckling load are investigated.

**8-Paper ID: 28**

**Title:** Effect of Pressing Pressure on Density and Hardness of Powder Miscanthus Reinforced Brake Pads

**Authors:** Mahmut UNALDI,RecaiKUS

**Abstract:** The aim of this paper is to develop new natural fibre reinforced for automotive brake pad application. For this purpose, new brake pad samples were produced using Miscanthus as reinforcement ingredient. The other ingredients are Cashew, Alumina, Phenolic Resin, and Calcite.

Three different laboratory formulations were prepared with varying *Miscanthus* fibre contents from 10, 25, and 40 (wt) and these formulations were moulded four different moulding pressure values such as 50, 100, 200, and 300 MPa. Sieve analysis, density, apparent density, and hardness properties of brake pad samples produced are examined.

**9- Paper ID: 7**

**Title:** Positional Accuracy Based On A Load Identification Optimization On A Linear Motor Sheet Forming Feeder

**Authors:** Nazrul Idzham Kasim, Akhtar Razul Razali, Mohd Azam Musa

**Abstract:** Precision feeding is essential for micro-stamping, especially in multi-stage progressive forming operations, where necessary feeding rates also have to be maintained. Research in micro-stamping of thinner sheet metals (<100 microns) led to investigations of the performance of existing sheet-metal feeders, regarding their accuracy and repeatability in high speed micro-stamping. The results indicated that the pursuance of higher feeding accuracy and repeatability which aimed at 5-15% of the strip thickness was unachievable with the existing micro-feeders. A new high-precision and high-speed feeder was, therefore, developed for micro-sheet-forming. Initial non-optimized experimental results had showed high accuracy and repeatability were achieved.

**10- Paper ID: 15(ICAMAR)**

**Title:** Detection of Seismic Wave with Laser Interferometer

**Authors:** Woo-Ram LEE, Eun-Hwan OH, Min-Woo LIM, Kwan-Ho YOU

**Abstract:** In this paper, we propose a seismic wave detection process using a laser interferometer as a seismometer. The laser interferometer system is an important equipment with its remarkable accurate capability for displacement measurement. During the process of the seismic wave measurement, however, environmental and nonlinearity error are occurred in a heterodyne laser interferometer. Through the extended Kalman filter compensation, the distortion is reduced. With a recursive STA/LTA algorithm, the PS-time of the seismic wave is determined and then the epicenter distance can be derived. Through some simulations, it is demonstrated that the proposed algorithm can reduce error factors and improve the measurement accuracy of a seismometer.

**11- Paper ID: M420**

**Title:** Performance Damage State for Concrete Wall Pier Reinforced with Shape Memory Alloy

**Authors:** Nursafarina Ahmad, Kader Newaj Siddiquee, A.B.M. Rafiqul Haque, M. Shahria Alam

**Abstract:** Defining performance damage states for reinforced concrete structural elements is the first step towards performance-based design. The unique property of Shape Memory Alloy (SMA) to recover residual deformation warrants further investigation towards its application in reinforced concrete (RC) structural walls. In this study nonlinear pushover analyses of different RC wall pier reinforced with SMA in their plastic hinge regions were performed using Seismostruct finite element analysis software. The analyses were performed to determine the following damage states: cracking, yielding and crushing of SMA-RC wall pier. Various parametric uncertainties are considered through multifactorial analysis of variance (ANOVA) method. It was found that, the height to

thickness ratio ( $H/t$ ) is the most significant factor influencing the performance damage state of SMA-RC wall piers. The results of other significant factors which influence the performance damage states of SMA-RC wall piers are also highlighted here.

**Note:** If you would like to deliver oral presentation but your paper is not in the session list, please contact us by Email: [cfp@icmssm.org](mailto:cfp@icmssm.org) (for ICMSSM 2014) ASAP. Thanks again for all your great attention and kind support to ICMSSM 2014.

*Thank you for all of your contributions!*

## UPCOMING CONFERENCE

### 2014 4th International Conference on Advanced Materials and Engineering Materials (4th ICAMEM 2014)

2014.10.16-10.17 Ningbo , China      2014.10.19-10.20 Hong Kong, China  
[www.icamem.org](http://www.icamem.org)

#### ◆ Goals

2014 4th International Conference on Advanced Materials and Engineering Materials (4th ICAMEM 2014) is being organized and will be held on Oct.16-17th, 2014 in Ningbo, China. The parallel meeting of 4th ICAMEM2014 will be held on Oct.19-20th, 2014 in Hong Kong, China. Authors can choose to attend the conference at Ningbo or Hong Kong!

All papers, both invited and contributed, will be reviewed by two or three experts from the PC. After a careful reviewing process, all accepted paper will be published in international journal "Advanced Materials Research" [ISSN:1022-6680, Trans Tech Publications].Advanced Materials Research is indexed by Elsevier: SCOPUS and Ei Compendex (CPX) .

#### ◆ Topics

T1: Advanced Materials Science  
T2: Engineering Materials Research  
T3: Materials Processing Technology  
T4: Materials Related Issue

#### ◆ Date

Paper Submission: Aug.29, 2014  
Notification of Acceptance: Sep.04, 2014  
Authors' Registration: Sep.10, 2014  
Conference Date:Oct.16-17, 2014(Ningbo)  
Oct.19-20(Hong Kong)

#### ◆ Submissions

##### 1. Submit by EASYCHAIR:

If you have an Easychair account, you may submit your paper by Easychair at <https://www.easychair.org/conferences/?conf=icamem2014>

##### 2. Email submission:

If you cannot upload paper or have other problems in using the EASYCHAIR system,

**Any questions please feel free to contact ICAMEM2014 Organizing Committee.**

you can choose to submit by sending email to [cfp@icamem.org](mailto:cfp@icamem.org).

#### ◆ Contact

Email: [cfp@icamem.org](mailto:cfp@icamem.org)  
QQ: 2607594628  
Tel: +86-24-83958169-801 Ms. Ji  
Website: <http://www.icamem.org>