CONFERENCE ABSTRACT

2017 International Conference on Sustainable Development and Green Technology

(SDGT 2017)

November 24-26, 2017

Nanhua University, Chiayi, Taiwan

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# Table of Contents

2017 HKCBEES Chiayi Conference Introductions 7
Presentation Instructions 8
Keynote Speaker Introductions 9
Brief Schedule for Conference 19
Detailed Schedule for Conference 21

## Session 1

T0005: An Agricultural Waste Based Composite to Replace or Reduce the Use of Plastics
   *Gordon Yu, Chih-Young Hung and Hsin-Yun Hsu*

T0021: Healthy Urban Planning: Spatial Dependence of Body Mass Index and Exposure to Night-Time Noise
   *Andrea Salmi and Jérôme Chenal*

T0034: The Potential Incorporation of Biochar into a Char-Water Fuel – Study of Chemical and Physical Properties
   *J P Pillai, Greg Griffin and M Pannirselvam*

   *Gordon Yu, Chih-Young Hung and Isaac Hung*

T0012: Thar Coalfield: Sustainable Development and an Open Sesame to the Energy Security of Pakistan
   *Adven Masih*

T0017: Comparison of Thermal Performances between Low Porosity Perforate Plate and Flat Plate Solar Air Collector
   *Hoy-Yen Chan, A A Vinson, S S Baljit and M H Ruslan*

T0047: A Project Design of Solar Chasing and Heating System
   *Yann-Long Lee, Feng-Che Tsai, Jan-Nan Chen and Chi-Rong Chen*

T0028: No Cost – Low Cost Compressed Air System Optimization in Industry
   *A Dharma, N Budiarsa, N Watiniasih and N G Antara*

T0019: Ecosystem Services and Federalism: A Case Study of Switzerland
   *Rémi Jaligot and Jérôme Chenal*

T0029: Layout guide for Burnt and Un-burnt Tropical Forest: The Diversity of Forest Plants and Insetcs for Sustainable Environmental
   *N L Watiniasih, J Tambunan, I M Merdana and I N G Antara*

T0038: Demonstration on Areca Catechu Tree Reuse with Supporting of Information Technology
   *Fang-Lin Chao, C K Wu and A K Chao*

T0041: The Estimation of a Carbon Footprint for a Debris Flow Disaster – a Case Study in Daniau Community in Taitung, Taiwan
   *Szu-Hsien Peng*
T0048: Political and Social Changes and Ecological Environment Evolution in Modern Times in China

Sun Tao

T0049: The Critical Pressure Gradient of Seepage Failure

Yao-Ming Hung and Chi-Teng Hung

T0050: The Deformation Simulation of Well after Pumping

Wei-Chi Hung and Yao-Ming Hung

T0051: The Delineation of Slope Land Range: A example in Yilan County, Taiwan

Siang-Min Wang, Pei-Rong Tsou, Yeh-Hsiu Chiang and Chi-Tien Chen

T0016: The Distinct Character of a Capital? From Formality to Regularity of our Ancient Capitals

T Kelly

Session 2

S1001: Ideal Flow Theory for the Double – Shearing Model as a Basis for Metal Forming Design

S Alexandrov and N T Trung

S0004: Springback Law Study and Application in Incremental Bending Process

Feifei Zhang, Kai He, Xiaobing Dang and Ruxu Du

S0006: Improvement of Thermal Radiation Characteristic of AC Servomotor Using Al-CNT Composite Material

Yoshimi Kikuchi, Hiroyuki Wakawaka and Masaaki Yanagihara

S0008: On Coupling between an External Circuit and a ZnO Nanowire Subjected to a Dynamic Axial Force

Shuaiqi Fan and Yuantai Hu

S0018: Electrochemical Detection and Photocatalytic Degradation of Environmental Hazardous Methyl Parathion by Using 3D Flower-like Praseodymium Molybdate Decorated Reduced Graphene Oxide Composite

Thangavelu Kokulnathan and Shen Ming Chen

S0014: One-step Microwave Plasma Enhanced Chemical Vapor Deposition (MW-PECVD) for Transparent Superhydrophobic Surface

Sukrit Thongrom, Yuthana Tirawanichakul, Nantakan Muensis and Chalongrat Deangngam

S0022: Electrochemical Synthesis of Poly (3,4-Ethylenedioxythiophene) on Terbium Hexacyanoferrate for Sensitive Determination of Tartrazine

Mani Sakthivel and Shen Ming Chen
T0026: Determination Plastic Properties of a Material by Spherical Indentation Based on the Representative Stress Approach

I Nyoman Budiarsa, I Nyoman Gde Antara, Agus Dharma and I Nyoman Karnata M

S0007: Nature Inspired Capacitive Sensor with Unique and Unclonable Characteristic

Cyril Karuthedath and Norbert Schwegesinger

S1002: Standard Deviation from the Average Cutting Velocity as a Criterion for Comparing Robot Trajectories and Manual Movements of a Doctor for Performing Surgical Operations in Maxillofacial Surgery

Andrei A. Vorotnikov, Maxim A. Buinov, Semen V. Bushuev, Yuri V. Poduraev and Andrei A. Chunihin

S1003: Criteria for Comparison of Robot Movement Trajectories and Manual Movements of a Doctor for Performing Maxillofacial Surgeries

Andrei A. Vorotnikov, Daniil D. Klimov, Elena A. Melnichenko, Yuri V. Poduraev and Ernest A. Bazykyan

S0015: Scheduling of Hybrid Types of Machines with Two-machine Flowshop as the First Type and a Single Machine as the Second Type

Ming-Chih Hsiao and Ling-Huey Su

S0023: Quality Control Process Improvement of Flexible Printed Circuit Board by FMEA

Siwaporn Krasaephol and Parames Chutima

S0027: Transportation of Part Supply Improvement in Agricultural Machinery Assembly Plant

Anusit Saysaman and Parames Chutima

S0028: Seed Defective Reduction in Automotive Electro-deposition Coating Process of Truck Cabin

Aekkalag Sonthilug and Parames Chutima

S3002: Singular Solutions for the Rigid Plastic Double Slip and Rotation Model under Plane Strain

S Alexandrov and E Lyamina

Session 3

A0006: Goat Farm Performance in Northern Mindanao, Philippines

Reynaldo L. Intong, Juhn E. Pepito, Jhonny M.Callejo and Emilio M. Cruz

A0007: Kinetic of Parboiled Pre-Germinated Brown Rice Cooking and Its Monitoring

Krongworakul, N. and Naivikul, O.

A0011: Broiler Partnerships Scheme Advantages Toward Minimising Its Production and
Marketing Risks (Case Study at Mojokerto District of East Java Indonesia)

_Hari Dwi Utami, Bambang Ali Nugroho, Umi Wisapti Ningsih, Lilik Eka Radiati, Hary Nugroho_

A0012: The Quality of Liquid Semen of Ongole Crossbred Cattle by Using Different Diluents on Cold Storage

_Aulia Puspita Anugra Yekti, Nurul Isnaini, Kuswati, Herni Sudarwati and Trinil Susilawati_

A0014: Change Motility and Structure of Spermatozoa Membrane Filial Ongole, Bali and Madura Cattle during Cooling Storage by Using Cep-2 Egg Yolk

_Trinil Susilawati, Dian Ratnawati, Nurul Isnaini, Kuswati, Aulia Puspita Anugra Yekti_

A0013: Bali Bull Fresh Semen Profile at Dry and Rainy Season

_Nurul Isnaini, Siti Aisah and Sri Wahjuningsih_

A0015: Effects of Different Drying Conditions on Protein-Enriched Instant Noodles Microstructure and Qualities Compared to Deep Frying

_Aujcharaporn Pongpichaiudom and Sirichai Songsermpong_

T0023: Accelerating the Industrialisation of The Building Sector to Harness Green Technologies and Deliver Social, Economic and Environmental Outcomes

_Karlson Charlie Hargroves, Peter Newman and Daniel Conley_

T0045: Toward Eco Product Development with Qualitative and CAE Design Process - Case Study of Flame Guiding Module

_Wei-Long Chen and F L CHAO_

T0002: The Effect of Monosodium Glutamate and Electrolyte Beverage to the Growth Rate of Chinese Morning Glory

_N. Nuiplot_

T0042: Improving Quality and Competitiveness of Agriculture in South Halmahera through Fairtrade Product Concept

_Amalia Suzianti, Hajid N. Atthousi, Ian B. Pratama and Zahrina Hasyati_

T0033: Simultaneous Recovery of Carotenes and Tocols from Crude Palm Olein using Ethyl Lactate and Ethanol

_Yin Leng Kua, Suyin Gan, Andrew Morris and Hoon Kiat Ng_

T0046: The Case of Detention Basin with the Concept of Sponge City

_Zoe Lin, Michael Liu, and Hermina Ho_

T0024: Measurements of the Received Signal Level and Service Coverage Area at the IEEE 802.11 Access Point in the Building

_N. Gunantara, P. K. Sudiarta, AAN Agung Indra and IN Gde Antara_
T0037: Sustainable and ICT-Enabled Development in Developing Areas: An E-Heritage E-Commerce Service for Handicraft Marketing

*Tufail Muhammad and KwanMyung Kim*

A0017: Fruit Waste Potential, a Weakness or a Potency, Doing Locally Effect Globally

*Setyadjit S., Ermi Sukasih and Risfaheri R.*

A0018: Utilization of Rice Husk for Production of Multifunctional Liquid Smoke

*R Risfaheri, H Hoerudin and M Syakir*

Poster Session

T0036: Flood Scenario Simulation and Disaster Estimation of Ba-Ma Creek Watershed in Nantou County, Taiwan

*SH Peng and Yen-Kun Hsu*

T0044: Study on Cascade Cyclone Calciner in a Pilot-scale Calcium Looping Carbon Capture System

*Yiang-Chen Chou, W.C. Chen, C.M. Huang, and H.W. Hsu*

S0020: A Study on Properties of Concrete Using Heavy Weight Waste Glass as Fine Aggregate

*So Yeong Choi, Il Sun Kim, San Kim, Yoon Suk Choi and Eunik Yang*

S0021: Study on Stability Characteristics of Green Shotcrete Soil Using Mineral Additives

*So Yeong Choi, Il Sun Kim, Gyung Jong Lee, Yoon Suk Choi and Eun Ik Yang*

One Day Visit

Conference Venue

Note

Feedback Information
2017 HKCBEES Chiayi Conference Introductions

Welcome to CBEES 2017 conference in Nanhua University, Chiayi, Taiwan. The objective of the Chiayi conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Sustainable Development and Green Technology.

Papers will be published in:


- International Journal of Environmental Science and Development (IJESD, ISSN: 2010-0264), which can be included in and indexed by Chemical Abstracts Services (CAS), CABI, DOAJ, Ulrich Periodicals Directory, Engineering & Technology Digital Library, Electronic Journals Library, Crossref, ProQuest.

Conference website and email: http://www.icsdgt.org; sdgt@cbees.net

About HKCBEES

The Hong Kong Chemical, Biological & Environmental Engineering Society (HKCBEES) was founded in 2007. It is an independent and scientific research and development organization. The Service can be traced back to the first work in 1999.

HKCBEES plays an influential role in promoting developments in Chemical, Biological & Environmental Theory and Applications in a wide range of ways. The mission of HKCBEES is to foster and conduct collaborative interdisciplinary research in state-of-the-art methodologies and technologies within its areas of expertise.

Good news! To join in HKCBEES member is free now. Please check the information on the website: http://www.cbees.org/list-33-1.html if you are interested in. Any question regarding to membership, please feel free to contact membership@cbees.org.
Presentation Instructions

Instructions for Oral Presentations

**Devices Provided by the Conference Organizer:**

- Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)
- Digital Projectors and Screen
- Laser Sticks

**Materials Provided by the Presenters:**

- PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

**Duration of each Presentation (Tentatively):**

- Regular Oral Presentation: about 13 Minutes of Presentation and 2 Minutes of Question and Answer
- Keynote Speech: about 30 Minutes of Presentation and 5 Minutes of Question and Answer

Instructions for Poster Presentation

**Materials Provided by the Conference Organizer:**

- The place to put poster

**Materials Provided by the Presenters:**

- Home-made Posters
- Maximum poster size is A1
- Load Capacity: Holds up to 0.5 kg

**Best Presentation Award**

One Best Oral Presentation will be selected from each presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of the session on November 25, 2017.

**Dress code**

Please wear formal clothes or national representative of clothing.
Keynote Speaker Introductions

Keynote Speaker I

Prof. Edward Yi Chang
National Chiao Tung University, Taiwan

Prof. Edward Yi Chang is Vice President, Dean of Research and Development & Chair Professor of National Chiao Tung University, Taiwan

Educational Background
University of Minnesota, Twin Cities USA Department of Materials Science and Engineering Ph.D
Department of Material Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan (1973-1977)

Experience
Dean of International College of Semiconductor Technology (2014-present)
Head of NCTU-TSMC Research center, National Chiao Tung University, Taiwan (2013-present)
Dean of Research and Development, National Chiao Tung University, Taiwan (2011-present)
Associate Dean of Engineering School NCTU (2009-2011)
Professor, Jointly Appointed, Departments of Material Science and Engineering / Electronics Engineering, National Chiao Tung University, Taiwan (2008-present)
Chairman, Department of Material Science and Engineering, National Chiao Tung University, Taiwan (2003-2007)
CEO, International Office, National Chiao Tung University, Taiwan (2002-2004)
Professor, Department of Material Science and Engineering, National Chiao Tung University, Taiwan (1999- Present)
General Manager, Hexawave Inc, Taiwan (1997-1999)
Member of technical staff, COMSAT Laboratory, USA (1988-1990)
Member of technical staff, Unisys Corporation, USA (1985-1988)
Topic: “GaN HEMT on Si Substrate for Low Cost, High-Performance Power Switching Device Applications”

Prof. Edward Yi Chang

Department of Materials Science and Engineering, National Chiao Tung University, Taiwan.

Abstract—GaN wide bandgap semiconductor based materials are promising for future high power and high frequency applications. In particular, the GaN high electron mobility transistor (HEMT) grown on large-size Si substrate is ideal for high power switching applications with low cost potential. The GaN HEMT based convertors and inverters have been demonstrated for electric vehicle (EV) applications. To achieve high efficiency, small current collapse GaN HEMT devices, various device and process issues have to be considered. These include the careful design of epitaxial structure and device layout. Furthermore, surface passivation technique is critical to achieve low dynamic on-resistance (Ron) and reliability. Moreover, for safety consideration, a normally-off device is highly required. Several approaches to achieve normally-off device will be presented in this talk, including gate-recessed, F- ion implantation, high-k interlayer insertion and a novel hybrid ferroelectric charge trap gate stack approaches. Also, to further reduce the production cost, a GaN HEMT device with fully-copper-based metallization will also be demonstrated. Finally, a low-cost, high-performance GaN on Si HEMT based power modules is demonstrated for power switching applications.
Keynote Speaker II

Prof. Masaharu Fujita
Disaster Prevention Research Institute, Kyoto University, Japan

Prof. Masaharu Fujita is currently Professor at the Research Center for Fluvial and Coastal Disasters of Disaster Prevention Research Institute, Kyoto University. He is the Managing Director of Japan Society of Erosion Control Engineering. He graduated at Kyoto University (Civil Engineering Department of Faculty of Engineering, Kyoto University) in 1980, and received the degree of Doctor of Engineering from Kyoto University in 1987. His research topics are sediment transport hydraulics, mechanism of sediment disasters, integrated sediment management, habitatology.

Affiliated Academic Organizations:
Japan Society of Civil Engineering
Japan Society of Erosion Control Engineering
Japan Society for Natural Disaster Science
Topic: “Recent Sediment Disasters in Japan and a New Approach for Warning System Using a Multi-hazard Simulator”
Prof. Masaharu Fujita
Disaster Prevention Research Institute, Kyoto University, Japan

Abstract—Typhoon TALAS hit the Kii Peninsula in 2011 and caused huge sediment disasters. The extremely high cumulative rainfall triggered more than 60 deep-seated landslides and some of them formed landslide dams. The rainfall is characterized by the high intensity and the very long duration time. Typhoon WIPHA caused simultaneously large number of shallow landslide in the Izu-ooshima in 2013. The feature of the rainfall event is the quick increase in rainfall intensity up to 120 mm/h after a strong antecedent rainfall. In 2014 unpredictable local heavy rainfall attacked Hiroshima city and caused sudden landslides and debris flows. The resident, therefore, could not have enough time for evacuation. Fig.1 shows the relation between rainfall intensity and soil water index in these three rainfall events. We have recently suffered from characteristic sediment disasters due to extreme rainfall events as shown in Fig.1.

The warning information on sediment disasters is presently provided by using a critical line expressing the critical condition on sediment disaster on a coordinate system of soil water index and rainfall intensity. This method is very effective for issuing an evacuation order at appropriate time against normal sediment disasters. However, this is only information on whether a disaster occurs or not. For the huge sediment disasters introduced above, more detailed information on possible multi hazards is necessary for more appropriate evacuation at better timing and to safer place. We develop a multi-hazard simulator supporting warning system for sediment disasters. The simulator can make information on multi hazards during heavy rainfall. As a watershed model, a unit-channel and unit-slope model is employed. Unit slopes are divided into slope units. The simulator is composed of several sub-models; a rainfall runoff model for unit-channels and unit slopes, a landslide model for slope units, a sediment transport on unit-channels. The information provided by this simulator is a landslide risk and a flood inundation risk affecting evacuation actions. The risk is categorized into 4 levels. The simulator is applied to some storm events to indicate the performance.

Fig.1 Recent heavy rainfall patterns
Fig.2 Change in the risk levels
Keynote Speaker III

Prof. Shih-Shiung Chen

College of Science and Technology, Nanhua University, Taiwan

Shih-Shiung Chen is Chair Professor and Dean of the college of Science and Technology, Nanhua University. He concerned much about human health and food safety thus he devoted most of his life in organic agriculture development in Taiwan. Prof. Chen is one of the main consultants of the Council of Agriculture, Executive Yuan of Taiwan. He assists government of Taiwan to establish organic agriculture regulations and certification system as well as performing a specific role for nationwide development and promotion of organic agriculture for more than 20 years.

Topic: “Organic Agriculture Development in Taiwan: The Role of Educational Institutes”

Shih-Shiung Chen and Chang-Ju Huang-Tzeng

College of Science and Technology, Nanhua University, Taiwan

Abstract—During the initiation and development of organic agriculture in Taiwan, scholars of educational and research institutes played very important roles. Taiwan has more than 164 universities, about 7 of them have college of agriculture, and another 2 have agricultural departments. The authors of this paper are two of the specialist who are the first devoting in research, extension, marketing and information spread during early stage of organic agricultural development. And the 7 Districts Agricultural Improvement Station and the Tea Improvement Stations have been contributing to the development and extension of organic farming technique, and especially encouraging farmers to practice organic farming and making and field demonstration. The promotion of organic agriculture in Taiwan from 1986 till the present is just 30 years. Fortunately professors in NCHU, NIU, and MDU have the chance to celebrate their participation. We wish that people in Taiwan have enough wisdom, with organic people in the world, to actively accelerate the promotion of organic agriculture, we hope in the future 30 years; People in Taiwan can work together, hand in hand, to reach the goal that “Taiwan becomes an organic country”.

- 13 -
Prof. Kien Wen Sun was born in Taipei, Taiwan. He holds a PhD from the Department of Electrical Engineering at Princeton University in New Jersey, United States. From 1995-2000, he was on the faculty of the Electronic Engineering at Feng Chia University, Taiwan. He joined the faculty of Department of Physics as a professor at National Dong Hwa University, Hualien, Taiwan, from 2000-2005. Since year 2005, he became a professor of Department of Applied Chemistry at National Chiao Tung University, Hsinchu, Taiwan. During his sabbatical in 2012, he was a visiting professor at Department of Electrical and Computer Engineering of University of Waterloo, Canada. Dr. Sun was appointed as the Department Chair of Applied Chemistry at NCTU from 2012-2014. He is also currently a Joint Appointment Professor at Department of Electronics Engineering and the Director of the Center of Nano Science and Technology at National Chiao Tung University. His research interests include femtosecond laser and laser spectroscopy in III-V compound semiconductors, spintronics, nanoimprint, nanolithography, nanoelectronics, nanodiamonds, thermal transport in nanostructures, organic/inorganic solar cells, and chemical sensor technology. He has published more than 100 journal papers in above research fields. He was awarded for the Prof. Rudolph A. Marcus Award 2016 by Publishing Division of Cognizure and LOGNOR. He has served as reviewers and editorial board members for numerous high-impact international journals. He is now a senior editor of Science Advances Today and a Fellow Member for Hong Kong Chemical, Biological & Environmental Engineering Society (HKCBEES).

Topic: “Nanoimprint and Its Applications on Optoelectronics and Nanodevices”

Prof. Kien Wen Sun was born in Taipei, Taiwan. He holds a PhD from the Department of Electrical Engineering at Princeton University in New Jersey, United States. From 1995-2000, he was on the faculty of the Electronic Engineering at Feng Chia University, Taiwan. He joined the faculty of Department of Physics as a professor at National Dong Hwa University, Hualien, Taiwan, from 2000-2005. Since year 2005, he became a professor of Department of Applied Chemistry at National Chiao Tung University, Hsinchu, Taiwan. During his sabbatical in 2012, he was a visiting professor at Department of Electrical and Computer Engineering of University of Waterloo, Canada. Dr. Sun was appointed as the Department Chair of Applied Chemistry at NCTU from 2012-2014. He is also currently a Joint Appointment Professor at Department of Electronics Engineering and the Director of the Center of Nano Science and Technology at National Chiao Tung University. His research interests include femtosecond laser and laser spectroscopy in III-V compound semiconductors, spintronics, nanoimprint, nanolithography, nanoelectronics, nanodiamonds, thermal transport in nanostructures, organic/inorganic solar cells, and chemical sensor technology. He has published more than 100 journal papers in above research fields. He was awarded for the Prof. Rudolph A. Marcus Award 2016 by Publishing Division of Cognizure and LOGNOR. He has served as reviewers and editorial board members for numerous high-impact international journals. He is now a senior editor of Science Advances Today and a Fellow Member for Hong Kong Chemical, Biological & Environmental Engineering Society (HKCBEES).

Abstract—This presentation covers basic principles of nanoimprint, fabrication of molds, hot embossing, and UV-curing techniques. Periodic nanostructures covering large area can be realized via nanoimprint at reduced cost and with high throughput. The nanostructures can be applied on photovoltaics and LEDs to serve the purposes for enhanced anti-reflection or light extract and to improve device efficiency. We will also demonstrate applications of this technique on nanodevices with reduced fabrication cost and improved performance. Recent advances in the roll-to-roll printing of functional nanomaterials will also be discussed.
Keynote Speaker V

Prof. Shen-Ming Chen
National Taipei University of Technology, Taiwan

Prof. Shen-Ming Chen (h-index > 60) received his PhD degrees in chemistry from National Taiwan University, Taipei, Taiwan. He was a visiting postdoctoral fellow with the Institute of Inorganic Chemistry, Friedrich-Alexander University Erlangen-Nuremberg, Germany in 1997. He joined Department of Chemical Engineering, National Taipei Institute of Technology, Taipei, Taiwan in 1985. He had been an associate professor of Department of Chemical Engineering, National Taipei Institute of Technology, Taipei, Taiwan from 1991 to 1997. Since August 1997, he has been a full professor of Department of Chemical Engineering and Biotechnology, National Taipei University of Technology. He has been the Dean (Curator) of library, National Taipei University of Technology, Taiwan from 2000 to 2006 and the Director of Extracurricular Activity, office of student affairs, National Taipei University of Technology, Taiwan from 1995 to 2000.

Prof. Shen-Ming Chen has published over 500 research and review papers in international SCI journals. Some of their papers have been selected as the most cited papers in the Journal of Electroanalytical Chemistry and Biosensor & Bioelectronics. He received three times Distinguish Professor awards. He also received three times Outstanding Research Award from National Taipei University of Technology, Taiwan. He have edited or attended two books for NOVA publications titled “Nanostructured Materials for Electrochemical Biosensors” and “Biosensors: Properties, Materials and Applications” and contributed four book chapters.

His research interest includes nanocomposites, bionanomaterials, bionanotechnology, electrochemical biosensor, biosensors, bioelectrochemistry, chemical materials, electroanalytical Chemistry, electrocatalysis and electroanalysis, photoelectrochemistry, metalloproteins, metalloporphyrins, nanotechnology, spectroscopic techniques, scanning probe techniques, quartz crystal microbalance, materials research, fuel cells, solar cell and photovoltaic cells.

Topic: “Synthesis of Nanostructured Materials for Electrochemical Sensors and Biosensors Applications”

Prof. Shen Ming Chen
Department of Chemical Engineering and Biotechnology, National Taipei University of Technology, Taiwan

Abstract—Recently, many investigations have been carried out for the fabrication of chemically
modified electrodes on the use of micro and nanocomposites for different applications. Possibly nanomaterials modified electrodes are emerging as a real candidate for variety of potential applications due to its high surface area and biocompatibility along with better antifouling ability. The emerging applications of modified electrodes are in the fabrication of devices for biosensors and environmental sensors. Since, the environmental pollution has become a worldwide problem and the wastewater from the industries contains many organic pollutants and heavy metal ions which cause serious effect on the environment. Hence, we have prepared different chemically modified electrodes on the use of micro and nanomaterials for electrochemical sensing of biomolecules and environmental pollutants. For instance, the β-cyclodextrin entrapped graphite modified screen printed carbon electrode (SPCE) can selectively detect the dopamine (DA) with the low limit of detection (LOD) of 11 nM. The biomass-derived activated carbons, fullerene-C60/Pd nanoparticles and fullerene C60 wrapped graphene oxide composite modified electrodes show the LOD of 4.5, 5.6 and 8 nM, respectively for DA. The aforementioned modified electrodes can detect the DA in the real samples such as snail hemolymph, human blood serum, rat brain solution and commercial DA injection samples. The Cu nanoparticles/pectin scaffold on graphene modified electrode detects the hydrogen peroxide and glucose with a LOD of 2.5 and 3.1 µM, respectively. The zinc oxide–copper oxide heterostructures modified electrode shows the LOD of glucose about 3.8 nM. While, the glucose oxidase immobilized reduced graphene oxide (rGO) and fullerene-C60 composite modified electrode shows the LOD for glucose about 35 µM. On the other hand, we have also developed the sensitive modified electrodes for trace level detection of Environmental Hazardous Chemicals such as hydrazine, nitrite, Hg ions, Pb ions and nitrobenzene. For example, the Pd nanoparticles on porous activated carbons modified electrode can simultaneously detect Cd, Pb, Cu, and Hg ions with the LOD of 41, 50, 66 and 54 nM, respectively. The Ni nanoparticles on carbon porous materials modified electrode shows the LOD for Hg ions as 2.1 nM. The Bi nanoribbon modified electrode detect the lead and cadmium ions with a lower LOD of 0.104 µg/L and 0.145 µg/L. The pectin stabilized Au nanoparticles exhibited high catalytic activity towards amitrole and shows the LOD of 35 pM. Green synthesized Ag nanoparticles/rGO modified can detects the NB even up to 0.5 µM with the LOD of 0.26 µM. The Au nanoparticles decorated activated graphite modified SPCE shows LOD of 0.57 nM for hydrazine.

Notes and reference
2. V. Veeramani et al, Scientific Reports 5:10141 | DOI: 10.1038/srep10141.
Keynote Speaker VI

Prof. Wai-Jane Ho
College of Biotechnology and Bioresources, Da-Yeh University, Taiwan

Prof. Wai-Jane Ho is the fifth president (2007.10 ~ 2010.10) of Da-Yeh University, Changhua, Taiwan and the Chair Professor of College of Biotechnology and Bioresources. She achieved the botany doctor degree of the University of Florida, USA.

Experiences:
Visiting Professor, Da-Yeh University, Taiwan;
President of Da-Yeh University, Taiwan;
Acting President of Da-Yeh University, Taiwan;
Vice President of Da-Yeh University, Taiwan;
Counselor and Technical Supervisor of Agriculture Committee of Executive Yuan;
Vice Director of the Provincial Government Agriculture and Forestry Department, Taiwan & Director of Forest Service;
Counsellors & Group leader of group five of Secretariat of Provincial government, Taiwan;
Associate Researcher and Section Supervisor of Provincial Government Seedling Improving Multiplying Farm
Topic: “Study on Improving the Growth of Cinnamomum Kanehirai and Cinnamomum Osmophloeum Nursery Plants with Non-toxic Chemicals”

Abstract—Forest nurseries were mostly located in low-elevation mountains in Taiwan. Seedlings or vegetative cuttings in the same seedbed were planted in high density for years as a continuous cropping. Taiwan having humid and rainy climate, is suitable for the incidence of various plant pathogens which sometimes cause serious disease problems on young tree seedlings/plantlets. In order to reduce the application of fungicides, young cutting plantlets from two kinds of tree, Cinnamomum kanehirai and Cinnamomum osmophloeum were soil drenched with different concentration of chitosan (Chs, 500/1000/2000ppm), salicylic acid (SA, 50/100/150/200ppm) or phosphorous acid (P, 1000 1500/2000ppm) for the evaluation of their effect on growth and disease incidence.

Soil drenched plants derived from cuttings of Cinnamomum kanehirai showed that Chs2000ppm, SA150~200ppm and P2000 ppm significantly increased the leaf fresh weight or leaf area comparing with the control (ρ <0.05). Plants derived from cuttings of Cinnamomum osmophloeum, soil drenched with chemicals, revealed that Chs1000ppm, SA200ppm and P1500ppm significantly increased the leaf fresh weight (ρ <0.05).

Total chlorophyll content in leaves of C. kanehirai were declined in all treatments. However, the treatments of chitosan, salicylic acid and phosphorous acid for C. osmophloeum plants gave significant benefits (ρ <0.05). Chs2000ppm, SA50ppm and P15000ppm were suitable concentrations.

Our experiments indicated that cuttings grown in pots, drenched with proper concentrations of Chs, SA and P, were prominent on increasing the leaf fresh weight of C. kanehirai and C. osmophloeum.
# Brief Schedule for Conference

**Day 1**

**November 24, 2017 (Friday)**

**Venue:** 永續中心 Sustainability Center

**Arrival Registration** 10:00~17:00

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**November 25, 2017 (Saturday)** 08:50~18:30

Arrival Registration, Keynote Speeches, and Conference Presentations

*Tip: (The bus will pick up the participations at the lobby of Nice Prince Hotel at 08:00 a.m., November 25. If you need to take it, please gather there before 08:00 a.m.)*

## Morning Conference

**Venue:** 雲水居 (Staff Residence) B244

**Opening Remark**

Prof. Tsong-Ming Lin, Nanhua University, Taiwan

**Keynote Speech I**

09:00-09:35

Prof. Edward Yi Chang, National Chiao Tung University, Taiwan

**Keynote Speech II**

9:35-10:10

Prof. Masaharu Fujita, Disaster Prevention Research Institute, Kyoto University, Japan

**Coffee Break & Group Photo Taking** 10:10-10:30

**Keynote Speech III**

10:30-11:05

Prof. Shih-Shiung Chen, College of Science and Technology, Nanhua University, Taiwan

**Keynote Speech IV**

11:05-11:40

Prof. Kien Wen Sun, National Chiao Tung University, Hsinchu, Taiwan

**Keynote Speech V**

11:40-12:15

Prof. Shen-Ming Chen, National Taipei University of Technology, Taiwan

**Lunch** 12:15-13:20

**Venue:** 咖啡學 Coffeeology
### Afternoon Conference

**Venue:** 雲水居 (Staff Residence) B244  
Keynote Speech VI  
Prof. Wai-Jane Ho, Da-Yeh University, Taiwan

<table>
<thead>
<tr>
<th>Presentations</th>
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</table>
| **Session 1(part. 1):**  
Venue: 永續中心 Sustainability Center  
14:00~15:30  
6 presentations-Topic:  
“Energy Engineering and Ecological Environment Management” |
| **Session 2(part. 1):**  
Venue: 學海堂 Xue Hai Tang Building (S104)  
14:00~15:30  
6 presentations-Topic:  
“Material Science and Mechanical Manufacturing” |
| **Session 3(part. 1):**  
Venue: 學海堂 Xue Hai Tang Building (S109)  
14:00~15:30  
6 presentations-Topic:  
“Agricultural Science and Sustainable Development” |

**Coffee Break 15:30~15:45**

<table>
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<tr>
<th>Presentations</th>
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| **Session 1(part. 2):**  
Venue: 永續中心 Sustainability Center  
15:45~18:30  
11 presentations-Topic:  
“Energy Engineering and Ecological Environment Management” |
| **Session 2(part. 2):**  
Venue: 學海堂 Xue Hai Tang Building (S104)  
15:45~18:15  
10 presentations-Topic:  
“Material Science and Mechanical Manufacturing” |
| **Session 3(part. 2):**  
Venue: 學海堂 Xue Hai Tang Building (S109)  
15:45~18:30  
11 presentations-Topic:  
“Agricultural Science and Sustainable Development” |

**Poster Session:**  
Venue: 永續中心 Sustainability Center  
14:00~18:30  
4 presentations

**Dinner 18:50**  
Venue: 嘉義耐斯王子大饭店 Nice Prince Hotel

### Day 3

November 26, 2017 (Sunday) 08:00~17:00  
One Day Visit

**Tips:** Please arrive at the conference room 10 minutes before the session begins to upload PPT into the laptop.
## Detailed Schedule for Conference

**November 25, 2017 (Saturday)**

**Venue:** 雲水居 (Staff Residence) B244

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:50–09:00</td>
<td><strong>Opening Remark</strong>&lt;br&gt;Prof. Tsong-Ming Lin, Nanhua University, Taiwan</td>
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<tr>
<td>09:00–09:35</td>
<td><strong>Keynote Speech I</strong>&lt;br&gt;Prof. Edward Yi Chang, National Chiao Tung University, Taiwan&lt;br&gt;Topic: “GaN HEMT on Si Substrate for Low Cost, High-Performance Power Switching Device Applications”</td>
</tr>
<tr>
<td>09:35–10:10</td>
<td><strong>Keynote Speech II</strong>&lt;br&gt;Prof. Masaharu Fujita, Disaster Prevention Research Institute, Kyoto University, Japan&lt;br&gt;Topic: “Recent Sediment Disasters in Japan and a New Approach for Warning System Using a Multi-hazard Simulator”</td>
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<tr>
<td>10:10–10:30</td>
<td>Coffee Break &amp; Group Photo Taking</td>
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<tr>
<td>10:30–11:05</td>
<td><strong>Keynote Speech III</strong>&lt;br&gt;Prof. Shih-Shiung Chen&lt;br&gt;College of Science and Technology, Nanhua University, Taiwan&lt;br&gt;Topic: “Organic Agriculture Development in Taiwan: The Role of Educational Institutes”</td>
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<tr>
<td>11:05–11:40</td>
<td><strong>Keynote Speech IV</strong>&lt;br&gt;Prof. Kien Wen Sun&lt;br&gt;National Chiao Tung University, Hsinchu, Taiwan&lt;br&gt;Topic: “Nanoimprint and Its Applications on Optoelectronics and Nanodevices”</td>
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<tr>
<td>11:40–12:15</td>
<td><strong>Keynote Speech V</strong>&lt;br&gt;Prof. Shen-Ming Chen&lt;br&gt;National Taipei University of Technology, Taiwan&lt;br&gt;Topic: “Synthesis of Nanostructured Materials for Electrochemical Sensors and Biosensors Applications”</td>
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<tr>
<td>12:15–13:20</td>
<td>Lunch</td>
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<td>Time</td>
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<tr>
<td>15:30~15:45</td>
<td>Coffee Break</td>
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<tr>
<td>18:50</td>
<td>Dinner</td>
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</tbody>
</table>
Session 1

Tips: The schedule for each presentation is for reference only. We strongly suggest you attend the whole session in order not to miss your presentation.

Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 永續中心 Sustainability Center

Session 1 (Part. 1): 6 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0005 Presentation 1 (14:00~14:15)
An Agricultural Waste Based Composite to Replace or Reduce the Use of Plastics
Gordon Yu, Chih-Young Hung and Hsin-Yun Hsu
eTouch Innovation Co. Ltd.

Abstract—BioPlastics such as PLA has a few drawbacks among them incompatible with existing recycling stream and hence classified as “unrecyclable” in many countries; not truly biodegradable in natural conditions since it requires high temperature to decompose (>58°C); high impact to the environment for it’s high carbon footage production process; and competing to our food production for taking the corps as it’s feedstock. FPC™ (Fiber Particulate Composite) presented in this paper resolves all the above difficulties by using agricultural waste which contains fiber as it’s main ingredient, mixed with proprietary Compatiblizer™ which is converted starch without adding any man-made chemicals, so FPC™ is inherently biodegradable and compostable, yet FPC™ can be mixed with almost any plastics in any percentage, making it exhibits no harm to the existing recycling system, such characteristics also make FPC™ to be an excellent binder to create new material from various recycled plastics including ocean plastic waste and textile waste.

Products using 100% FPC™ are not only biodegradable & compostable, but also a truly circular bioeconomy fashion meeting the EU requirement of bio-renewable without
competing with our food source, while significantly reduce the carbon dioxide emission & air pollution for the agricultural waste would otherwise be burned off especially in China, India or other developing countries; and in the meantime create high value since the processing of biomass is not targeted to obtained low-value calories through burning, but the replacement of petro-chemical products without causing long-term burden to our land and ocean in a manner of low carbon and low impact to our planet earth. The end-of-life of 100% FPC™ products can be converted to organic fertilizer through easily available room temperature composting, compliant with EU’s 1st deliverable of Circular Economy Package with new rules on organic and waste-based fertilizers in March of 2016.
Healthy Urban Planning: Spatial Dependence of Body Mass Index and Exposure to Night-Time Noise

Andrea Salmi and Jérôme Chenal
École polytechnique fédérale de Lausanne (EPFL), Switzerland

Abstract—Obesity is a public health challenge worldwide: by 2025 the global prevalence could reach 18% in men and 21% in women (NCD-RisC 2016). High body-mass index (BMI) is an important risk factor for diabetes, cardiovascular disease and cancer (NCD-RisC 2016). According to World Health Organisation (WHO, 2011) in Europe during daytime 33% of individuals are annoyed by noise while during the night 20% reports disturbed sleep. The enhancement of noise by traffic can be considered a contributory cause (Mueller et al 2017). Exposure to levels over 55 decibels (EEA 2015 recommendation) may be associated with high BMI in the population (Christensen et al 2016) or in population subgroups (Oftedal et al 2015). Reasons are that a high noise level may discourage physical activity and boost energy intake (Parrish&Teske 2016) with a consequent weight gain, but also that sleep disorders may in turn cause metabolic troubles favouring obesity (Miedema&Vos 2007). While high values of BMI may be clustered and spatially dependent in dense urban areas (Joost et al. 2016), the spatial codependence of high BMI and noise values has not clearly been shown yet. Furthermore, according to WHO noise exposure over the suggested limits (EEA, 2015), is related to an increased risk of CVDs. The probability of having cardiovascular diseases (CVDs), is higher for overweight and obese people, and it should not be worse by noise exposure. In this study, we calculated the night-noise mean (SonBase 2014, compatible with the EU Environmental Noise Directive) for the 5 classes obtained after computation of Local Indicators of Spatial Association (LISA; Anselin et al 1995) on the BMI of the participants in the Bus Santé study, a cohort managed by the Geneva University Hospitals (N=15’544; Guessous et al. 2014). We expected the mean of dBs to be significantly higher in the group showing spatial dependence of high BMI values (high-high class). We ran an ANOVA and multiple T-tests to compare the dB means between LISA clusters. The approach was applied to the participants of the whole State Geneva cohort, and to a reduced set of individuals.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 永續中心 Sustainability Center

Session 1 (Part. 1): 6 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0034 Presentation 3 (14:30~14:45)

The Potential Incorporation of Biochar into a Char-Water Fuel – Study of Chemical and Physical Properties
J P Pillai, Greg Griffin and M Pannirselvam
RMIT University, Australia

Abstract—Biochar has the potential to be used for a wide range of applications. One of these includes utilisation as a char-water fuel, with the aim of substituting less sustainable fuels in the future. This paper reports the chemical and physical properties of biochar produced from sugarcane bagasse for use as a char-water fuel. Sugarcane bagasse was pre-treated with diammonium phosphate (DAP) and pyrolysed to increase the yield of biochar. An untreated sample of bagasse was also converted to biochar for comparison. The treated samples were formulated into char-water fuel and analysed for rheological behaviour. Viscosities were comparable to that reported for coal-water slurry fuels and, in some cases, other biological by-products (i.e. biooils), but were higher than diesel or gasoline. Thermal gravimetric analysis (TGA) and particle size distribution were conducted on the char samples and the energy content was measured using bomb calorimetry. The energy content of the char-water fuel would be similar to that of coal-water fuels if beneficiation of the biochar to remove ash components can be performed.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 永續中心Sustainability Center

Session 1 (Part. 1): 6 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T001 Presentation 4 (14:45~15:00)


Gordon Yu, Chih-Young Hung and Isaac Hung
eTouch Innovation Co. Ltd.

Abstract—Incineration has been the only effective way of reducing plastic waste after recycling in the modern societies, yet a better solution for processing waste plastics and simultaneously producing renewable energy is presented and demonstrated in this paper. R-ONE™, an optimized Pyrolysis technology converting varieties of plastic waste into clean and low sulfur content fuel which meets the most stringent international standard, emits no toxic gases such as Dioxins and other secondary pollution. R-ONE™ recycles 100% of its own output of syngas (5-10%) as the major energy source while converting around 80% of the mixed plastic waste into high grade fuel; and the other 10-15% into carbon black. In comparison with incinerators, carbon dioxide production by R-ONE™ is around 100X lower. Furthermore, its energy efficiency (from the energy balance calculation) is one of the highest in the world compared to any renewable energy technologies or any waste processing technologies. Both of these objectives are reached by R-ONE™.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 永續中心Sustainability Center

Session 1 (Part. 1): 6 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0012 Presentation 5 (15:00~15:15)

Thar Coalfield: Sustainable Development and an Open Sesame to the Energy Security of Pakistan

Adven Masih
Ural Federal University, Russian Federation

Abstract—The paper discusses the role of Thar-coalfield, a 175 Billion tones reserve in enhancing the energy and combating global environmental change from the local and regional aspects. Pakistan's energy requirements are potentially huge. Being the sixth largest country in the world, with its growing population exceeded 190m by 2015. Rising population, improved living standards, increased per capita energy use, and industrialization has led to a high energy demand growth. According to latest reports the gap between the demand and supply of electricity is around 6,000MW. To meet the projected demand exploiting indigenous resources, such as Thar coalfield, a 100,000MW generation capacity reserve, could be the possible answer. Due to sustainable techniques in energy sector, 1) Coal mining is moving towards sustainable development; 2) circular economy has proven useful concept for promoting sustainable development; 3) coal industry can minimize its environmental impact from local to global level.

Besides energy goals, environmental degradation associated with the mining activity poses a serious threat to the region. Therefore, some challenges need to be addressed, e.g., discharge management issues, concerns regarding pollution control, lack of technology needed to replenish solid waste; and, increased socioeconomic and environmental pressure on the coal industry. The study discusses how sustainable development measures in Thar coalfield can run the engines of economic growth without hurting the natural environment promoting prosperity in Pakistan.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 永續中心Sustainability Center

Session 1 (Part. 1): 6 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0017 Presentation 6 (15:15~15:30)

Comparison of Thermal Performances between Low Porosity Perforate Plate and Flat Plate Solar Air Collector

Hoy-Yen Chan, A A Vinson, S S S Baljit and M H Ruslan
National University of Malaysia, Malaysia

Abstract—Flat plate solar air collector is the most common collector design, which is relatively simpler to fabricate and lower cost. In the present study, perforated plate solar collector was developed to improve the system thermal performance. A glazed perforated plate of 6mm holes diameter with square geometry was designed and installed as the absorber of the collector. The influences of solar radiation intensity and mass flow rate on the thermal performance were investigated. The perforated collector was compared with the flat plate solar collector under the same operating conditions. The highest values of thermal efficiency in this study for the perforated plate (PP) and the flat plate (FP) solar collectors were 59% and 36% respectively, at solar radiation intensity of 846 Wm⁻² and mass flow rate of 0.02 kgs⁻¹. Furthermore, PP collector gave better thermal performance compared to FP collector; and compared to previous studies, the present perforated design was compatible with the flat plate with double pass designs.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0047 Presentation 7 (15:45~16:00)

A Project Design of Solar Chasing and Heating System

**Yann-Long Lee**, Feng-Che Tsai, Jan-Nan Chen and Chi-Rong Chen
Chaoyang University of Technology, Taiwan

*Abstract*—This study designed a solar chasing and heating system, mainly focusing on the height and inclination angle of Fresnel lens, discusses the effect of how aqueous solution temperature rise. The research methods are based on experimental design. Through the sensor and voltage measurement test, to facilitate the solar chasing system design, and make sure the system can be running for long periods of time. In addition, an insulation pipe was covered by sponge coating, can be effectively blocking heat loss, to enhance the insulation effect.

The research results shows that if the sun light and lens at a vertical angle, it’s preferred focusing height is about 20 cm. The temperature of the aqueous solution can reach above 100 °C. This project made of heat collection and solar chasing more efficient, and more simplification structure.

The study are expected to provide a reference for the future designers and solar heater industry.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心 Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0028 Presentation 8 (16:00~16:15)

No Cost – Low Cost Compressed Air System Optimization in Industry

A Dharma, N Budiarsa, N Watiniasih and N G Antara

Electrical Engineering Department, Indonesia

Abstract—Energy conservation is a systematic, integrated of effort, in order to preserve energy sources and improve energy utilization efficiency. Utilization of energy in efficient manner without reducing the energy usage it must. Energy conservation efforts are applied at all stages of utilization, from utilization of energy resources to final, using efficient technology, and cultivating an energy-efficient lifestyle. The most common way is to promote energy efficiency in the industry on end use and overcome barriers to achieve such efficiency by using system energy optimization programs. The facts show that energy saving efforts in the process usually only focus on replacing tools and not an overall system improvement effort. In this research, a framework of sustainable energy reduction work in companies that have or have not implemented energy management system (EnMS) will be conducted a systematic technical approach in evaluating accurately a compressed-air system and potential optimization through observation, measurement and verification environmental conditions and processes, then processing the physical quantities of systems such as air flow, pressure and electrical power energy at any given time measured using comparative analysis methods in this industry, to provide the potential savings of energy saving is greater than the component approach, with no cost to the lowest cost (no cost - low cost). The process of evaluating energy utilization and energy saving opportunities will provide recommendations for increasing efficiency in the industry and reducing CO₂ emissions and improving environmental quality.
T0019 Presentation 9 (16:15~16:30)

Ecosystem Services and Federalism: A Case Study of Switzerland
Rémi Jaligot and Jérôme Chenal
Swiss Federal Institute of Technology Lausanne, Switzerland

Abstract—A fundamental element of a federated state is the division of power between a central government and the component states. Switzerland is a federation consisting of twenty-six sovereign states named canton. Each canton has its own government and parliament, leading to a decentralized public political power. Public policies with a spatial incidence are within the jurisdiction of the Confederation, cantons or municipalities. The vertical division of competences varies between policies and between cantons. This study focuses on land crop rotation areas (LCRAs) to assess the impact of federalism on the preservation of ecosystem services. The concept of LCRAs originates from the Wahlen Plan of 1940, which aimed to double the surface of cultivated land to ensure food self-sufficiency if imports would stop. The criteria applied to define LCRAs are heterogeneous between cantons, and remain unchecked. Slope, altitude and land quality are among numerous criteria used to build cantonal inventories of LCRAs. Various policies have been implemented since the creation of LCRAs, mostly economical to sustain and to intensify agricultural production. However, conflicts between LCRAs and environmental interests such as ecological compensation, watercourse restoration or flood protection affect the provision of ecosystem services (ES), which are the contributions of ecosystems to human well-being. LCRAs provide the service of food production, but their purpose is questioned as Switzerland relies increasingly on food imports and LCRAs are sometimes converted to building zones, further impairing the provision of ES. The current literature focuses largely on ex-ante assessment of ecosystem services. However, this would not allow differentiating the differing implementation strategies of cantons, and explicitly quantify their impact on the provision of ecosystem services. In this contribution, we will demonstrate how an ex-post assessment may be more relevant to detect potential gaps in the implementation of policies in a federal state. The objective is to relate specific actions to a specific impact at the canton level based on empirical evidence, and to incorporate spatio-temporal dynamics that are critical in land-use planning. It can inform decision-makers about future sustainable land-use, and foster the redistribution of resource exploitation, such as food production, to optimize the sustainable provision of other ecosystem services.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0029 Presentation 10 (16:30~16:45)

Layout guide for Burnt and Un-burnt Tropical Forest: The Diversity of Forest Plants and Insects for Sustainable Environmental

N L Watiniasih, J Tambunan, I M Merdana and I N G Antara
Udayana University, Indonesia

Abstract—Forest fire is a common phenomenon in tropical forest likes in Indonesia. Beside the effect of soaring heat and lack of rain during dry season due to the tropical climate, farming system is also reported as one reason of forest fire in Indonesia. People of surrounding areas and neighbouring countries are suffering from the effect of forest fire. Plants and animals are the most suffer from this occurrence that they cannot escape. This study aimed to investigate the effect of previously burnt and un-burnt tropical forest in Borneo Island on the plant and insect diversity of the tropical forest. The result of the study found that the plants in previously burnt forest area was dominated by one species, while higher and more stable plant diversity was found in un-burnt forest. Although the number of individual insects was higher in previously burnt tropical forest, but the insects was more diverse in un-burnt tropical forest. The alteration of environmental conditions in previously burnt and un-burnt forest indicate that the energy held in natural forest support higher number and more stable insects than previously burnt forest.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心 Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0038 Presentation 11 (16:45~17:00)

Demonstration on Areca Catechu Tree Reuse with Supporting of Information Technology
Fang-Lin Chao, C K Wu and A K Chao
Chaoyang University of Technology, Taiwan

Abstract—Areca catechu can be commonly found in Taiwan and Asia. By the restriction of agriculture policy, often the tree is chopped down and left in the wild and became an extra burden on the local environment. In this study, reuse design cases and opportunities were collected as Blog, so that people can access more easily. To enhance the user’s awareness and information access it included the facets of its biology, culture history and reuse cases. Furthermore, we proposed demonstration supported with information technology. A blog can collect facts and examples with capabilities of multiple tags. This ability makes information search more accessible. The proposed approach combines both physical samples and visual elements in Blog which can be view by mobile phone. From the survey, Blog performs better than a regular internet search. Most people feel interesting, and some people were able to have own idea. Demonstration designs gather both elements will help to form a positive communication to the society with sustainable thinking.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0041 Presentation 12 (17:00~17:15)

The Estimation of a Carbon Footprint for a Debris Flow Disaster – a Case Study in Daniau Community in Taitung, Taiwan

Szu-Hsien Peng
Chienkuo Technology University, Taiwan

Abstract—In recent years, global warming and the greenhouse effect have created environmental issues around the world. Carbon footprint refers to the product, service or an event in a life cycle that is a result of human activity or which increases the global release of all greenhouse gases. Carbon footprint calculations allow enterprises to reduce carbon emissions and to improve product manufacturing processes. Many countries are actively expanding carbon footprint-related policies and studies. This study calculates the carbon footprint for a debris flow disaster. A FLO-2D is used to simulate a scenario and the resulting deposition depth, flow velocity and the affected area are determined. A life-cycle assessment method is then used to estimate the carbon footprint of reconstruction projects in Daniau Community in Taitung, Taiwan due to the debris flow that was induced by Typhoon Morakot. This study establishes an assessment model for the carbon footprint that can be used to assist future disaster reconstruction works.
Afternoon, November 25, 2017 (Saturday)
Time: 15:45~18:30
Venue: 永續中心Sustainability Center
Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”
Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0048 Presentation 13 (17:15~17:30)
Political and Social Changes and Ecological Environment Evolution in Modern Times in China
Sun Tao
Beijing Society for Philosophy of Nature, Science and Technology, China

Abstract—From the perspective of political and social changes, the paper scans the evolution of the ecological environment in modern times in China, with profound historical coordinates of the political and social revolution, based on the characteristics of Chinese modern political and social development, the research content is divided into three periods to respectively discuss the influences of political and social evolution on the environment in different periods. To be specific, it refers to the stirring political and social changes in the period of late Qing Dynasty and the Republic of China, the large-scale political and social movements in the 30 years after the founding of New China and the destruction of the ecological environment, the huge political and social changes leading to the crisis of the ecological environment since the reform and opening up. Then the paper approaches the subject from the evolutions of the ecological environment under the conditions of Political and social changes.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心 Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0049 Presentation 14 (17:30~17:45)

The Critical Pressure Gradient of Seepage Failure
Yao-Ming Hung and Chi-Teng Hung
Nanhua University, Taiwan

Abstract—Seepage erosion is usually the damage cause of hillslope. This study develop the equation of critical pressure gradient of soil initiation. The relationship between critical pressure gradient (CPG) and critical shear stress (CSS) from micro/grant view, were collected and analyzed. The micro view discussed the change in pore diameter due to particle erosion, in which CPG can be expressed by CSS, the porosity; and initial permeability of the soil. The grant view discussed the stability of hillslope by the interaction between the destabilizing shear stress and the resisting shear stress. The resisting shear stress can be obtained by the Mohr-Coulomb rule, and the CPG can be estimated by the CSS, cohesion, normal stress and angle of repose. The relationship between the micro view and grant view was established, and the calculation method and laboratory experiment of CPG were developed.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0050 Presentation 15 (17:45~18:00)

The Deformation Simulation of Well after Pumping

Wei-Chi Hung and Yao-Ming Hung
Nanhua University, Taiwan

Abstract—Over the past few decade, the stratum subsidence is very serious due to over-pumping groundwater in Taiwan. Over-pumping groundwater refers to the excessive extraction of the water content in the aquifer without corresponding groundwater replenishment. This study developed a model to estimate the safe-pumping rate of groundwater with the sufficient groundwater replenishment. The porous elastic modulus of solid mechanics, the basic linear elasticity of solid mechanics and the transient relationship of Darcy's law in the COMSOL 3D model, were employed to develop the estimation model. The groundwater hydrological data, and the well data published by the Ministry of Water Resources of the Ministry of Economic Affairs were also collected. The underground aquifer streamline distribution state, water pressure distribution, and soil deformation after a long period of pumping time were analyzed.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心 Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0051 Presentation 16 (18:00~18:15)
The Delineation of Slopeland Range: A example in Yilan County, Taiwan
Siang-Min Wang, Pei-Rong Tsou, Yeh-Hsiu Chiang and Chi-Tien Chen
Soil and Water Conservation Bureau of the Executive Yuan, Taiwan

Abstract—Hillslope is steep to prone to disaster. According to the Soil and Water Conservation Act (SWCA) in Taiwan, the regulations and conservation of hillslope is necessary for the protection of land and people. The definition of slopeland is the land elevation > 100 m, or the elevation < 100 m but the slope > 5% by the Slopeland Conservation and Utilization (SCU) in Taiwan. The Executive Yuan was announced the slopeland area in May 12, 2009. However, due to frequent changes in cadastral data, or the error in the determination of hillslope boundary, the hillslope area map is still necessary to re-review. Based on the slopeland data of Yilan County, this study compares the 2016 annual cadastral maps and the slopeland boundary maps in 2009. The problems can be divided into: (1) original cadastral problems; (2) new cadastral problems; (3) the cadastral changes using in the hillslope boundary; (4) the hillslope border crossing the cadastral map; and (5) the determination error of slopeland boundary. After the analysis of slopeland boundary, the slopeland area increased by 31.55 hectares within Yilan County. The standards operating procedures of this study can be used as the determination of slopeland boundary in the future.
Afternoon, November 25, 2017 (Saturday)

Time: 15:45~18:30

Venue: 永續中心 Sustainability Center

Session 1 (Part. 2): 11 presentations- Topic: “Energy Engineering and Ecological Environment Management”

Session Chairs: Prof. Masaharu Fujita & Assoc. Prof. Yaoming Hong

T0016 Presentation 17(18:15~18:30)

The Distinct Character of a Capital? From Formality to Regularity of our Ancient Capitals

T Kelly
Abu Dhabi University, Abu Dhabi, UAE

Abstract—Many cities were shaped by dynamics political and commercial factors and man-made layers whereas other capitals have been modeled spontaneously by natural influence. London is great sample of this approach and was described as a natural city planned over decades by many hands with great appreciation to natural terrain. Contrary mode is obvious in China where several factors behind the distinct identity of Chinese architecture and urban planning. Among those influences are the Metaphysics Philosophies or Emperor guidance who encouraged uniformity in many aspects in China including city planning. The aim of this paper is to highlight the impact of various forces and mankind dogmas in shaping up a unique character of famous capitals. Hence London and Beijing are the two contradictory case studies subject to deep analysis in parallel with other theories such as Yin - Yan and FENG Shui principles, to examine their impacts on urban planning in China.
Session 2 (Part. 1): 6 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S1001 Presentation 1 (14:00~14:15)

Ideal Flow Theory for the Double – Shearing Model as a Basis for Metal Forming Design
S Alexandrov and N T Trung
Beihang University, China; Institute for Problems in Mechanics, Russia

Abstract—In the case of Tresca’ solids (i.e. solids obeying the Tresca yield criterion and its associated flow rule) ideal flows have been defined elsewhere as solenoidal smooth deformations in which an eigenvector field associated everywhere with the greatest principal stress (and strain rate) is fixed in the material. Under such conditions all material elements undergo paths of minimum plastic work, a condition which is often advantageous for metal forming processes. Therefore, the ideal flow theory is used as the basis of a procedure for the preliminary design of such processes. The present paper extends the theory of stationary planar ideal flow to pressure dependent materials obeying the double shearing model and the double slip and rotation model. It is shown that the original problem of plasticity reduces to a purely geometric problem. The corresponding system of equations is hyperbolic. The characteristic relations are integrated in elementary functions. In regions where one family of characteristics is straight, mapping between the principal lines and Cartesian coordinates is determined by linear ordinary differential equations. An illustrative example is provided.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 1): 6 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0004 Presentation 2 (14:15~14:30)

Springback Law Study and Application in Incremental Bending Process
Feifei Zhang, Kai He, Xiaobing Dang and Ruxu Du
Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

Abstract—One incremental bending process has been proposed for manufacturing the complex and thick ship-hull plates. The accuracy and efficiency for this novel process is mainly dependent on the loading path and thus the unavoidable springback behavior should be considered in the loading path determination. In this paper, firstly, the numerical simulation method is verified by the corresponding experiment, and then the springback law during the incremental bending process is investigated based on numerical simulation, and later the loading path based on the springback law and the minimum energy method is achieved for specific machining shape. Comparison between the designed curve based on springback law and the new simulation results verifies that the springback law obtained by numerical simulation is believable, so this study provides a new perspective for the further research on incremental bending process.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 1): 6 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0006 Presentation 3 (14:30~14:45)

Improvement of Thermal Radiation Characteristic of AC Servomotor Using Al-CNT Composite Material

Yoshimi Kikuchi, Hiroyuki Wakawaka and Masaaki Yanagihara
Shinshu University, Japan

Abstract—This study deals with a high thermal conductivity material of aluminum-carbon nanotube (CNT) composite with carbon fiber (CF) and the high radiation performance of AC servomotor using a stator made of nanotube composite material. The composite fabrication process was performed by melting a mixture of granular aluminum of less than 200 μm and CNT under conditions of pressed atmosphere at the same time. Two kinds of motors made using aluminum and the composite were evaluated to confirm the effect of thermal conductivity as the motor stator. A test rod of the composite with 14 wt% CF-7 wt% CNT-aluminum indicated the excellent thermal conductivity of 169 W/(mK) in the radial direction and 173 W/(mK) in the lengthwise direction. According to the obtained temperature radiation characteristic of the AC servomotor, the composite stator using CNT decreased the consumption energy to 16% compared to the conventional one. As a result, the highly efficient motor improved the radiation characteristic using the CNT composite stator.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 1): 6 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0008 Presentation 4 (14:45~15:00)

On Coupling between an External Circuit and a ZnO Nanowire Subjected to a Dynamic Axial Force

Shuaiqi Fan and Yuantai Hu
Huazhong University of Science and Technology, China

Abstract—We analyze the output of a ZnO nanowire to an external circuit when subjected to a dynamic axial force. Electric potential is obtained by taking advantage of piezoelectric governing equation and Gauss law of electrostatic; and carrier concentration governing equation can be derived from the current balance conduction. Taking diffusion theory of Schottky into consideration, the metal-semiconductor contacts effect is analyzed. As a consequence, we obtain the electric potential distribution under axial tension as well as volt-ampere characteristic corresponding to metal-semiconductor circuit. The result indicates that the characteristics of current transport across the metal-semiconductor interface is concern to the strain produced by the axial deformation, that is, the volt-ampere characteristic can be tuned according to the strain. Thus, we can easily obtain the electric potential difference between the two ends of the ZnO nanowire which can further be regarded as an energy supplier to drive the external circuit to work. Such an analysis which combines piezoelectric and semiconducting properties may do some helping in the design of nanogenerators, piezoelectric field-effect transistors, piezoelectric diodes, piezoelectric chemical sensors, and piezo-phototronic devices. What’s more, a new field of piezoelectric has also been found based on the combination of piezoelectric and semiconducting properties, which utilizes the piezoelectric potential produced in the nanowire for the sake of tuning of carrier transport to design and fabricate mechanical electric devices. Under the direct of Professor Hu, Fan derived the output of a ZnO nanowire to an external circuit when subjected to a dynamic axial force; specifically he derived the distribution of electric potential, electric field, carrier concentration and electric displacement in the nanowire under axial force deformation.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 1): 6 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0018 Presentation 5 (15:00~15:15)

Electrochemical Detection and Photocatalytic Degradation of Environmental Hazardous Methyl Parathion by Using 3D Flower-like Praseodymium Molybdate Decorated Reduced Graphene Oxide Composite

Thangavelu Kokulnathan and Shen Ming Chen
National Taipei University of Technology, Taiwan

Abstract—The development of highly efficient electrocatalytic and photocatalytic system for the detection and degradation of poisonous organophosphorus pesticides has turned a hottest issue to protect human health and ecosystem. In this work, we have developed a novel flower-like praseodymium molybdate (Pr$_6$Mo$_{12}$; PrM)/reduced graphene oxide (rGO) composite (PrM/rGO) and it was prepared by simple sonication process followed by hydrothermal treatment with the assistance of urea and ethylene glycol. Moreover, the successful formation of PrM/rGO composite was confirmed by various analytical and spectroscopic methods. Herein, the prepared flower-like PrM/rGO composite played as a bifunctional catalytic activity (electrocatalyst and photocatalyst) for the trace level detection and degradation of environmental hazardous organophosphate pesticide methyl parathion (MP). As an electrocatalyst for MP detection, flower-like PrM/rGO composite delivers excellent electrocatalytic activity in terms of higher cathodic peak current and lower peak potential when compared with other modified and unmodified glassy carbon electrode (GCE). Furthermore, the PrM/rGO/GCE displayed wide linear response ranges (002-0.55 μM; 1.55 - 114 μM), good sensitivity (166 μAμM$^{-1}$cm$^{-2}$), lower detection limit (0.4 nM) and excellent selectivity for the MP sensing. Besides, the composite material is successfully applied to the real sample analysis in tap and lake (spiked MP) water samples for the determination of MP and the obtained recoveries are quite satisfactory. As an photocatalyst for the removal of MP, PrM/rGO could degrade above 98% MP after 70 min under visible light irradiation. The trapping experiments revealed that hydroxyl radicals (•OH) are the main reactive species in the photodegradation system. This work offers innovative insights and new pathway by which efficient detection and degradation of pesticides might be achieved and will arouse further applications in the various fields.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 1): 6 presentations - Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0014 Presentation 6 (15:15~15:30)

One-step Microwave Plasma Enhanced Chemical Vapor Deposition (MW-PECVD) for Transparent Superhydrophobic Surface

Sukrit Thongrom, Yutthana Tirawanichakul, Nantakan Muensit and Chalongrat Deangngam
Prince of Songkla University, Thailand

Abstract—We demonstrate a rapid and environmental friendly fabrication technique to produce optically clear superhydrophobic surfaces using poly(dimethylsiloxane) (PDMS) as a sole coating material. The inert PDMS chain is transformed into a 3-D irregular solid network through microwave plasma enhanced chemical vapor deposition (MW-PECVD) process. Thanks to high electron density in the microwave-activated plasma, coating can be done in just a single step with rapid deposition rate, typically much shorter than 10 s. Deposited layers show excellent superhydrophobic properties with water contact angles of ~170° and roll-off angles as small as ~3°. The plasma-deposited films can be ultrathin with thicknesses under 400 nm, greatly diminishing the optical loss. Moreover, with appropriate coating conditions, the coating layer can even enhance the transmission over the entire visible spectrum due to a partial anti-reflection effect.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 2): 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0022 Presentation 7 (15:45~16:00)

Electrochemical Synthesis of Poly (3,4-Ethylenedioxythiophene) on Terbium Hexacyanoferrate for Sensitive Determination of Tartrazine

Mani Sakthivel and Shen Ming Chen
National Taipei University of Technology, Taiwan

Abstract—In recent years, new and innovative materials such as carbon nanomaterials, metal oxides/hydroxides, and metal nanoparticles have been found with exclusive properties for various applications. In this list, metal hexacyanoferrate (MHCF) has been found as a new kind of inorganic poly-nuclear compound with zeolite structure. These kinds of materials have been used for several applications including supercapacitors, batteries, electrocatalysis, photocatalytic devices and sensor. Especially, MHCF has been focused on sensor applications owing to its good reversible redox process with low dissolution ability in solution and high stable film forming on the deposited substrate. Both chemical and electrochemical synthesis has been widely used for the preparation of MHCF. The chemical synthesis is considered as a time-consuming process due to following on number of steps during the synthesis. Alternatively, the electrochemical deposition of MHCF is considered to be an excellent way to prepare the stable film with unique morphology and crystallinity. Further to extend the application of electrodeposition and minimize the time consumption, the electrochemical deposition was followed for the first time to prepare the TbHCF. Here, TbHCF was electrochemically deposited on glassy carbon electrode (GCE). Afterward, 3,4-ethylenedioxythiophene was electropolymerized on pre-deposited TbHCF modified GCE to improve its stability. The PEDOT is performing as a charge transfer path with excellent electrochemical stability and also exhibits a higher stability in phosphate buffer than compared with other polymers. Hence, PEDOT is suggested as a suitable polymer for sensor application and especially for food analysis. Tartrazine (Tz) (C16H9N4Na3O9S2) is a kind of bright yellow azo food coloring dye and this synthetic food dye is the derivative of coal-tar and nitrous. It is widely used in many foods, medications, personal care and cosmetics products such as ice creams, cotton candy, cake, perfume, nail polish, and shampoo etc. Though it was permitted worldwide, the usage must be limited due to the serious side effects
such as asthma, thyroid cancer, permanent DNA damage, and itching etc. Recently, the electrochemical technique is more significant and substantial attractive technique for sensitive and quantitative determination of tartrazine owing to its inexpensive diagnostic tools, easy sample preparation, high sensitivity, long-term stability, reproducibility and high selectivity in sensing of Tz. The real sample analysis reveals the practical applicability of PEDOT@TbHCF/GCE for sensing of Tz in food samples.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 2): 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

T0026 Presentation 8 (16:00~16:15)

Determination Plastic Properties of a Material by Spherical Indentation Base on the Representative Stress Approach

I Nyoman Budiarsa, I Nyoman Gde Antara, Agus Dharma and I Nyoman Karnata M
Mechanical Engineering University of Udayana, Indonesia

Abstract—Under an indentation, the material undergoes a complex deformation. One of the most effective ways to analyze indentation has been the representative method. The concept coupled with finite element (FE) modelling has been used successfully in analyzing sharp indenters. It is of great importance to extend this method to spherical indentation and associated hardness system. One particular case is the Rockwell B test, where the hardness is determined by two points on the P-h curve of a spherical indenter. In this case, an established link between materials parameters and P-h curves can naturally lead to direct hardness estimation from the materials parameters (e.g. yield stress (σy) and work hardening coefficients (n)). This could provide a useful tool for both research and industrial applications. Two method to predict p-h curve in spherical indentation has been established. One is use method using C1-C2 polynomial equation approach and another one by depth approach. Both approach has been successfully. An effective method in representing the P-h curves using a normalized representative stress concept was established. The concept and methodology developed is used to predict hardness (HRB) values of materials through direct analysis and validated with experimental data on selected samples of steel.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 2): 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0007 Presentation 9 (16:15~16:30)

Nature Inspired Capacitive Sensor with Unique and Unclonable Characteristic

Cyril Karuthedath and Norbert Schwesinger

Technical University of Munich, Germany

Abstract—Background of this paper is the development of sensors showing a nature like characteristic. The sensor is able to detect excitations on inertia bases and operates capacitive. It consists of a miniaturized interdigitated electrode structure on a printed circuit board, a flexible and conductive membrane of PDMS located in a certain distance above and a certain number of steel balls fixed on top of the membrane. The steel ball distribution is random and the conductivity of the membrane is not homogeneous across the membrane. Due to this double random distribution, no sensor equals the other, although the external geometry is equal. The overall size of the sensor is 4.7mm x 4.7mm x 1.7mm. Tilt, acceleration or magnetic fields are capable of causing forces on the steel balls and therefore relative movements between the membrane and the electrode structures. Due to this movement, capacity changes of the arrangement are measurable. This paper describes besides the fabrication of conductive membranes the preparation of regarding sensors. Process technology makes cloning of the sensors impossible. Although all process steps are suited for mass production, no sensor equals the other. Measurements with these sensors prove that each sensor reacts differently to the same excitation. Calculations of the Intra-Concordance-Coefficient show the similarity of the sensors for equal excitations. On the other hand, the maximum Inter-Concordance-Coefficient reveals the differences of such sensors very clearly. Such a characteristic, i.e. equal reaction to equal excitation and an output of significantly different signals allows considering each sensor as a unique device. The sensors obviously behave like receptors in natural organisms. These unusual properties of uniqueness and impossibility to clone make the sensors very interesting for highly secure identification demands. In combination with a very simple measurement procedure, the sensors are an attractive hardware base for technical security solutions.
Standard Deviation from the Average Cutting Velocity as a Criterion for Comparing Robot Trajectories and Manual Movements of a Doctor for Performing Surgical Operations in Maxillofacial Surgery

Andrei A. Vorotnikov, Maxim A. Buinov, Semen V. Bushuev, Yuri V. Poduraev and Andrei A. Chunihin
Moscow State Technological University “STANKIN”, Russia

Abstract—This article presents experimental studies comparing trajectories obtained from the movements of a medical instrument by a surgeon and the robot KUKA LWR4 +. The comparison is made according to one of the four main criteria – standard deviation from the average cutting velocity. Such metrological studies are a method of justifying the expediency of using a robot for medical operations. This criterion can be used to compare trajectories when performing medical operations in maxillofacial surgery using a diode laser. The presented comparison criterion is based on the ISO 9283 standard. In addition to the main criterion, there are 2 additional ones. The trajectories for comparison were obtained by scanning the movements of a medical instrument using a coordinate measuring machine - the laser tracker LTD800. With the use of a robot, it is possible to achieve higher accuracy of trajectories by the velocity of movement of the medical instrument in comparison with a surgeon.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 学海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 2): 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S1003 Presentation 11 (16:45~17:00)

Criteria for Comparison of Robot Movement Trajectories and Manual Movements of a Doctor for Performing Maxillofacial Surgeries

Andrei A. Vorotnikov, Daniil D. Klimov, Elena A. Melnichenko, Yuri V. Poduraev and Ernest A. Bazykyan

Moscow State Technological University “STANKIN”, Russia

Abstract—In this article, in order to justify the expediency of using a robot for maxillofacial operations with a diode laser, 4 basic criteria for comparing typical trajectories are presented that allow quantifying the program movements of the robot and the manual movements of the surgeon. The presented comparison criteria are in part based on the ISO 9283. An experimental setup has been developed for the research, in which the medical instrument is moved using the robot KUKA LWR4 +. The robot’s movements are measured using a coordinate measuring machine - laser tracker. Along with the measurements of the program movements of the robot, the manual movements of the surgeon are also measured.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 2): 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0015 Presentation 12 (17:00~17:15)

Scheduling of Hybrid Types of Machines with Two-machine Flowshop as the First Type and a Single Machine as the Second Type

Ming-Chih Hsiao and Ling-Huey Su
Chung Yuan Christian University, Taiwan

Abstract—This research addresses the problem of scheduling hybrid machine types, in which one type is a two-machine flowshop and another type is a single machine. A job is either processed on the two-machine flowshop or on the single machine. The objective is to determine a production schedule for all jobs so as to minimize the makespan. The problem is NP-hard since the two parallel machines problem was proved to be NP-hard. Simulated annealing algorithms are developed to solve the problem optimally. A mixed integer programming (MIP) is developed and used to evaluate the performance for two SAs. Computational experiments demonstrate the efficiency of the simulated annealing algorithms, the quality of the simulated annealing algorithms will also be reported.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 2): 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0023 Presentation 13 (17:15~17:30)

Quality Control Process Improvement of Flexible Printed Circuit Board by FMEA

Siwaporn Krasaephol and Parames Chutima
Chulalongkorn University, Thailand

Abstract—This research focuses on the quality control process improvement of Flexible Printed Circuit Board (FPCB), centred around model 7-Flex, by using Failure Mode and Effect Analysis (FMEA) method to decrease proportion of defective finished goods that are found at the final inspection process. Due to a number of defective units that were found at the final inspection process, high scraps may be escaped to customers. The problem comes from poor quality control process which is not efficient enough to filter defective products from in-process because there is no In-Process Quality Control (IPQC) or sampling inspection in the process. Therefore, the quality control process has to be improved by setting inspection gates and IPCQs at critical processes in order to filter the defective products. The critical processes are analysed by the FMEA method. IPQC is used for detecting defective products and reducing chances of defective finished goods escaped to the customers. Reducing proportion of defective finished goods also decreases scrap cost because finished goods incur higher scrap cost than work in-process. Moreover, defective products that are found during process can reflect the abnormal processes; therefore, engineers and operators should timely solve the problems. Improved quality control was implemented for 7-Flex production lines from July 2017 to September 2017. The result shows decreasing of the average proportion of defective finished goods and the average of Customer Manufacturers Lot Reject Rate (%LRR of CMs) equal to 4.5% and 4.1% respectively. Furthermore, cost saving of this quality control process equals to 100K Baht.
**Afternoon, November 25, 2017 (Saturday)**

**Time:** 14:00~18:15

**Venue:** 學海堂 Xue Hai Tang Building (S104)

**Session 2 (Part. 2):** 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

**Session Chairs:** Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0027 Presentation 14 (17:30~17:45)

Transportation of Part Supply Improvement in Agricultural Machinery Assembly Plant

**Anusit Saysaman** and **Parames Chutima**

Chulalongkorn University, Thailand

*Abstract*—This research focused on the problem caused by the transportation of part supply in agricultural machinery assembly plant in Thailand, which is one of the processes that are critical to the whole production process. If poorly managed, it will affect transportation of part supply, the emergence of sink cost, quality problems, and the ability to respond to the needs of the customers in time. Since the competition in the agricultural machinery market is more intense, the efficiency of part transportation process has to be improved. In this study, the process of transporting parts of the plant was studied and it was found that the efficiency of the process of transporting parts from the sub assembly line to its main assembly line was 83%. The approach to the performance improvement is done by using the Lean tool to limit wastes based on the ECRS principle and applying pull production system by changing the transportation method to operate as milkrun for transportation of parts to synchronize with the part demands of the main assembly line. After the transportation of parts from sub-assembly line to the main assembly line was improved, the efficiency raised to 98% and transportation process cost was saved to 540,000 Baht per year.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 2): 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S0028 Presentation 15 (17:45~18:00)

Seed Defective Reduction in Automotive Electro-deposition Coating Process of Truck Cabin

Aekkalag Sonthilug and Parames Chutima

Chulalongkorn University, Thailand

Abstract—The case study company is one of players in Thailand’s Automotive Industry who manufacturing truck and bus for both domestic and international market. This research focuses on a product quality problem about seed defects occurred in the Electro-Deposition Coating Process of truck cabin. The 5-phase of Six Sigma methodology including D-Define, M-Measure, A-Analyze, I-Improve, and C-Control is applied to this research to identify root causes of problem for setting new parameters of each significant factor. After the improvement, seed defects in this process is reduced from 9,178 defects per unit to 876 defects per unit (90% improvement).
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:15

Venue: 學海堂 Xue Hai Tang Building (S104)

Session 2 (Part. 2): 10 presentations- Topic: “Material Science and Mechanical Manufacturing”

Session Chairs: Prof. Norbert Schwesinger & Prof. Edward Yi Chang

S3002 Presentation 16 (18:00~18:15)

Singular Solutions for the Rigid Plastic Double Slip and Rotation Model under Plane Strain
S Alexandrov and E Lyamina
Beihang University, China; Institute for Problems in Mechanics, Russia

Abstract—In the mechanics of granular and other materials the system of equations comprising the rigid plastic double slip and rotation model together with the stress equilibrium equations under plane strain conditions forms a hyperbolic system. Boundary value problems for this system of equations can involve a frictional interface. An envelope of characteristics may coincide with this interface. In this case, the solution is singular. In particular, some components of the strain rate tensor approach infinity in the vicinity of the frictional interface. Such behavior of solutions is in qualitative agreement with experimental data that show that a narrow layer of localized plastic deformation is often generated near frictional interfaces. The present paper deals with asymptotic analysis of the aforementioned system of equations in the vicinity of an envelope of characteristics. It is shown that the shear strain rate and the spin component in a local coordinate system connected to the envelope follow an inverse square root rule in its vicinity.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 1): 6 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0006 Presentation 1 (14:00~14:15)

Goat Farm Performance in Northern Mindanao, Philippines

Reynaldo L. Intong, Julnar E. Pepito, Jhonny M. Callejo and Emilio M. Cruz

Central Mindanao University, Philippines

Abstract—Goat has always a place in most of the farming systems in the Philippines. It may have a minor role, but their importance in the rural life had long been recognized, so that the condition in which they are kept must be assessed. A study was conducted to evaluate the performance of backyard and commercial farms in the northern Mindanao Region. Provinces included were Bukidnon, Misamis Oriental and Misamis Occidental. Site identification was based on goat population. The following were gathered from 34 backyard and 5 commercial farms: average doe per farm, kidding index, kidding size, kidding interval, type of birth, sex ratio of kids, birth status, of kids, average daily gain and mortality. Average number of doe per farm for backyard is 7 and 34 for commercial. There is a lower kidding index and kid size as against the national average both for backyard and commercial. Kidding intervals in the backyard is shorter than the national average, but the commercial is longer by 13.63 days than the national. Birth type for backyard is dominated by single tone followed by twins and triplets. The commercial has similar trend on birth types. Backyard had higher percentage of kids born alive (99%) than commercial (96.55%) Kids in the Region have better growth performance than the national average both in backyard and commercial. Mortality among kids in the backyard below 1 month is higher while in the commercial highest mortality was in kids 1-3 months old. Results of the evaluation of goat farm performance showed that the major problems in goat raising in the region are poor kid performance, poor dam performance and high mortality. However, a lot of technological options which are products of previous researches are already available and can be delivered to goat raisers.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 1): 6 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0007 Presentation 2 (14:15~14:30)

Kinetic of Parboiled Pre-Germinated Brown Rice Cooking and Its Monitoring

Krongworakul, N. and Naivikul, O.
Kasetsart University, Thailand

Abstract—Parboiled pre-germinated brown rice or PPGBR is rice which was modified by germinating and parboiling to improve its quality. It is considered health benefit due to the hydrolysis of high molecular weight polymers which decreased the molecular size and produced bio-functional substances during germination. Normally, the qualities of cooked rice are depended on many factors; cooking condition is one of them. The purpose of this work is aim to determine the activation energy (Ea) of rice cooking process and develop the time-temp indicator or TTI for monitoring the process. The kinetic of PPGBR from KDML 105 cooking was determined by measuring the hardness value of cooked rice over time. The activation energy of rice cooking, derived from arrhenius plots of cooking rate constant was 14.86 kJ/mole. TTI was developed based on chemical reaction to monitor food quality during processing. The absorbance at 420 nm from reaction was measured over time at 80°C, 90°C and 100°C. The Ea of TTI which calculated from Arrhenius equation was 96.55 kJ/mol. The coefficient of determination (R2) of the TTI from Arrenius plot at 80°C, 90°C and 100°C were 0.877, 0.909 and 0.974 respectively. The difference between the Ea of the TTI which developed in this research and the Ea of rice cooking was more than 40 kJ/mole. It means that the minimum energy that required to start chemical reaction of TTI was higher than those of rice cooking process. Therefore, the TTI could be adjusted to obtain Ea similar to Ea of rice cooking process by the chemical reaction factors, such as pH, temperature, reactant concentrations and the ratio between reactants.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 1): 6 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0011 Presentation 3 (14:30~14:45)

Broiler Partnerships Scheme Advantages Toward Minimising Its Production and Marketing Risks (Case Study at Mojokerto District of East Java Indonesia)

Hari Dwi Utami, Bambang Ali Nugroho, Umi Wisapti Ningsih, Lilik Eka Radiati, Hary Nugroho
University of Brawijaya, Indonesia

Abstract—Small scale broiler farmers have faced problems of the capital limitation, less information and technology access, and lead to uncertainty in providing the input production as well as no marketing guarantee. The existence of poultry partnership scheme may become alternative risk management strategy in supplying the continuity DOC, feed concentrate, Vitamin, and medicine in up-stream sub-system and ensuring for broiler marketing at downstream sub-system. Research proposed to relate with production and marketing risk alleviation for broiler plasma farmers at Mojokerto Regency. Case study used 30 plasma farmers who selected by purposive sampling method. Data consisted of six broiler production periods during one year. Primary data consisted of production cost, revenue, and liabilities that obtained by survey method using structured questionnaire. Core Company and related institution has provided secondary data. Data analysis employed descriptive technique with applying economic formulation involving Profit, Rentability, and Debt to Asset Ratio (DTAR). Results discovered that poultry partnership participants was male farmers aged between 31 - 40 years old with tertiary school attainment, 7 – 10 years experiences in operating broiler farming, and less than two years joining in broiler partnership scheme. The first produce period has utilised the poultry partnership scheme in reducing production risk through the good production performance in terms of FCR which still involved in the range of core company standard (1.68), low mortality (4.10%), and quite higher of harvest live weight broiler (1.95 Kg). The role of broiler partnership scheme in mitigating market risks occurred in the sixth harvest time through financial performance achievement on the basis of high profit (IDR 399/Kg live body weight), the low category of enterprise and economic rentabilities (REnt=4.07% and REco = 1.68%), and a limited payment capability toward total liabilities as the solvency level in the caution category (DTAR = 55.87%).
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 1): 6 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0012 Presentation 4 (14:45~15:00)

The Quality of Liquid Semen of Ongole Crossbred Cattle by Using Different Diluents on Cold Storage

Aulia Puspita Anugra Yekti, Nurul Isnaini, Kuswati, Herni Sudarwati and Trinil Susilawati

Brawijaya University, Indonesia

Abstract—The aim of this study was to evaluate the liquid semen quality of Ongole Crossbred Cattles sperm by using different diluents during cooling storage. This research was conducted at Research Centre Beef Cattle at Grati Pasuruan regency- Indonesia. The material used was fresh semen of Ongole crossbred cattle with the motility at least 70%. Semen was collected by using artificial vagina with 10 times of replications. The treatment used were sperm on CEP-2 (T1) and CEP-2 without BSA + egg albumin (T2),Tris aminomethane (T3) and tris aminomethane without raffinose (T4) diluents. The concentration of liquid semen was made 100 million / ml. The liquid semen was stored refrigerator temperature of 3-5 °C until the individual motility was reached to 40%. The parameters measured were motility, viability and abnormality of sperm. the experimental design used was completely randomized design. The result showed that there was a decrease in the percentage motility of individual spermatozoa during storage up to 8 days, however T4 diluent (yellow Tris Egg without raffinose + 20% egg yolks) can maintained the individual motility as 43, 5% after 7 days of storage. In general, the average percentage of sperm viability up to 8 days storage was still above 70%. In conclusions, the liquid semen can be stored up to 7 days on colling storage by using different diluents, furthermore tris aminomethane without raffinose is the best diluent to maintained the quality of sperm in liquid semen.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 1): 6 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0014 Presentation 5 (15:00~15:15)

Change Motility and Structure of Spermatozoa Membrane Filial Ongole, Bali and Madura Cattle during Cooling Storage by Using Cep-2 Egg Yolk

Trinil Susilawati, Dian Ratnawati, Nurul Isnaini, Kuswati, Aulia Puspita Anugra Yekti

Brawijaya University, Indonesia

Abstract—The motility of spermatozoa is one of the parameters that determine the semen quality of bull. The purpose of this study is (1) To examine spermatozoa motility changes during storage of 3-5 °C By using different diluents on Filial Ongole, Bali and Madura Cattles (2) Analysis of the structure of the spermatozoa membrane after cooling. This research was conducted at Research Centre Beef Cattle at Grati Pasuruan regency- Indonesia. The material used were 2 heads of PO, Bali and Madura bulls. Semen was collected by using artificial vagina with 10 times of replications. The collected semen with progressive motility > 70% was processed into liquid semen. The diluent used was CEP-2 + Egg yolk. The concentration of liquid semen was made 100 million / ml. The liquid semen were stored for 5 days in refrigerator temperature of 3-5 °C. The daily motility of liquid semen (D0-D5) were observed by using Sperm Computerize Analysis (SCA). The parameters measured on fresh semen were volume, pH, colour, consistency, concentration, Mass Motility, Individual motility, Viability, Total motile spermatozoa and Abnormality of sperm. While the liquid semen were ( motility, progressive motility and hiperactive motility, the experimental design used was Block design. The results showed that Filial Ongole, Bali and Maduracattle can maintain the sperm quality up to day 5 with motility (79,9 + 6,8%; 83,8 + 8,2% and 75,3 + 12,2%), progressive motility (62,1 ± 6,5 %; 61,4 ± 10,6 %; 51,1 ± 10,4 %) and hyperactive motility (3,8 ± 2,7%; 8,4 + 3,9% and 2,0 + 1,1%). Analysis of spermatozoa membrane structure using scanning electron microscope showed that in fresh semen and after 5 days storage on Filial Ongole, Bali and Madura Cattle there were no membrane damage. But there was a membrane that opens on the head of the spermatozoa or called acrosome reaction process.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 1): 6 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0013 Presentation 6 (15:15~15:30)

Bali Bull Fresh Semen Profile at Dry and Rainy Season

Nurul Isnaini, Siti Aisah and Sri Wahjuningsih
Brawijaya University, Indonesia

Abstract—This research was conducted to study of Bali bull fresh semen profile in dry and rainy season. The material used was semen of 14 heads Bali bull in 3, 5, 6, 10 and 11 years old. The method used was case study and the data were analyzed by descriptive. The results showed that the highest vs the lowest: semen volume, sperm concentration, and sperm individual motility were 6.05 ± 0.5 ml in July 2016 at dry season vs 4.54 ± 1.21 ml in January 2016 at rainy season, 1159.25 ± 211.28 (10^6 sperm/ml) in September 2016 at dry season vs 959.71 ± 164.25 (10^6 sperm/ml) in May 2016 at dry season, 66.98 ± 0.05% in September 2016 at dry season vs 54.12 ± 0.15% in November 2015 at rainy season respectively. It be concluded that Bali bull fresh semen profile at dry season was better than rainy season.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0015 Presentation 7 (15:45~16:00)

Effects of Different Drying Conditions on Protein-Enriched Instant Noodles Microstructure and Qualities Compared to Deep Frying

Aujcharaporn Pongpichaiudom and Sirichai Songsermpong
Kasetsart University, Thailand

Abstract—The rising concern regarding the high residual oil content in deep-fried products has rapidly increased the demand for low fat, non-fried instant noodles. To overcome this problem, 3 alternative drying methods (microwave, infrared and hot-air drying processes) were studied on the quality of protein-enriched instant noodle (PEIN) and compared to deep frying. The drying time of frying, microwave, infrared and hot air drying were 1, 4, 20.50, and 80 min, respectively. The result revealed that the gelatinization degree of fried PEIN was higher than in dried PEIN. Although microwave-dried PEIN had the highest gelatinization enthalpy (0.55 J/g), it was rehydrated in 3 min in hot water of 90 °C to the same degree as fried PEIN, which was due to greater internal porosity from the high drying rates. The microwave-dried PEIN had a reduction in the fat content of more than 80% compared to fried PEIN. Moreover, it reduced the total plate count, E. coli and S. aureus levels to below those allowable limit and were considered safe for consumption. Accordingly, microwave drying has advantages in terms of quick dehydration and rehydration over infrared and hot-air drying and had a greater fat content reduction compared to deep frying and promotes the provision of a healthy and convenient product for consumers.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

T0023 Presentation 8 (16:00~16:15)

Accelerating the Industrialisation of The Building Sector to Harness Green Technologies and Deliver Social, Economic and Environmental Outcomes

Karlson Charlie Hargroves, Peter Newman and Daniel Conley
Curtin University, Australia

Abstract—Most buildings are still constructed one brick or timber at a time, over lengthy periods on-site, using outdated technology. This paper poses the question of whether the manufacture of buildings using new green technologies and production line techniques from advanced manufacture can transform building to be less wasteful, quicker, more affordable, and more sustainable. This is an important question as the industrialisation of the buildings sector presents a significant opportunity for the building and construction sectors worldwide. Findings suggest that between 2011 and 2012 the economic output from the industrialised manufacture of buildings globally increased by a staggering 50% to just over US$90 billion, with nearly half of this manufactured in the Asia-Pacific region. The paper points out that there is great potential for the manufacture of buildings to be harnessed to significantly strengthen both the building and manufacturing sectors while harnessing green technologies to reduce building operating costs. The research suggests that domestic building industries around the world will face strong international competition in the near future, especially as the quality of imported prefabricated and manufactured building offerings is increasing and the price is decreasing. However the transition to manufactured buildings must be undertaken in such a way as to harness a nations existing pool of skills, trades, and technologies so as to allow workforce transitioning in a manner that strengthens industry. The paper highlights a number of challenges to upscaling building manufacture related to finance, insurance, and warranty structures, and presents potential options for overcoming such barriers. This paper presents findings of research undertaken as part of a Sustainable Built Environment National Research Centre (SBEnrc) in Australia in collaboration with the Cooperative Research Centre (CRC) for Low Carbon Living.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

T0045 Presentation 9 (16:15~16:30)

Toward Eco Product Development with Qualitative and CAE Design Process - Case Study of Flame Guiding Module

Wei-Long Chen and F L CHAO
Chaoyang University of Technology, Taiwan

Abstract— Sustainable products become increasingly important for company in addressing eco-performance to satisfy global environmental regulations. Case study of flame guiding module reviewed design process and concerns related to the torch design. For enhancing flame height, the torch was embedded with an airflow guidance structure. The design process and design methodologies were investigated as an eco-design case study. Combine qualitative and CAE simulation were proposed to fulfil its main and auxiliary functions including reduction of impact during use. The design guidelines help prevent mistake arrangements, CAE helps understand combustion phenomenon. The flow field simulation enables fine tune of geometric design. Functional test and measurement are carried out to confirm the product features. On Eco-performance, we choose 5 items for evaluation the status of previous and redesign module, namely function need, low impact material, few manufacturing steps, low energy consumption, and safety. The radar diagram indicates that eco-performance of redesign module is better. Life cycle assessment calculated the carbon footprint of the manufacturing and processing stage with Eco-it. By using recycled steel in the flame module, it reduces raw material stage carbon footprint significantly.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

T0002 Presentation 10 (16:30~16:45)

The Effect of Monosodium Glutamate and Electrolyte Beverage to the Growth Rate of Chinese Morning Glory

N. Nuiprot
Valaya Alongkorn Rajabhat University under the Royal Patronage, Thailand

Abstract—The research entitled “The Effect of Monosodium Glutamate (MSG) and Electrolyte Beverage to the Growth Rate of Chinese Morning Glory” was aimed 1) to study the growth rate of Chinese Morning glory by using different catalyst chemicals, and 2) to compare the growth rate of Chinese Morning glory between using only pure water, only MSG, only electrolyte beverage, and both MSG and electrolyte beverage. In the end, it was hoped that: if these catalyst chemicals are effective in growth rate of Chinese Morning glory and there are sufficient necessary nutrients for plants, the farmers will use the best catalyst instead of using higher price of fertilizer. It was found that using only electrolyte beverage as a catalyst chemical showed the significant highest growth rate (1.9 cm height/day), and using only MSG as a catalyst chemical showed the lowest growth rate (1.12 cm height/day), while using both catalyst chemicals and only pure water showed the growth rate at 1.17 and 1.14 cm height/day, respectively.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

T0042 Presentation 11 (16:45~17:00)

Improving Quality and Competitiveness of Agriculture in South Halmahera through Fairtrade Product Concept
Amalia Suzianti, Hajid N. Atthousi, Ian B. Pratama and Zahrina Hasyati
Universitas Indonesia, Indonesia

Abstract—South Halmahera is one of the districts in North Maluku Province, Indonesia in which the potential of agriculture is not followed by the income of the farmers around. Therefore, we propose to apply sustainable supply chain management and the fair-trade concept for the agriculture products. The results of this research are expected to be applied to solve the problem in developing the economy potential of Papua-Maluku islands region and to give strategic solution for agriculture main program in South Halmahera. This research focuses on mapping the requirements of fair-trade in comparison to actual situation in South Halmahera by doing gap analysis and build action plans to fulfil the requirements for sustainable supply chain management and fair trade certification.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

T0033 Presentation 12 (17:00~17:15)

Simultaneous Recovery of Carotenes and Tocols from Crude Palm Olein using Ethyl Lactate and Ethanol

Yin Leng Kua, Suyin Gan, Andrew Morris and Hoon Kiat Ng
University of Nottingham Malaysia Campus, Malaysia

Abstract—This paper demonstrates the use of ethyl lactate and ethanol as green and safe solvents to extract phytonutrients such as carotenes and tocols from crude palm olein (CPO) before they are lost during oil refining process. The effects of mixing time (10-40 min), temperature (10-30°C) and proportion of CPO (20-60%) were studied in terms of the extraction of individual carotenes (α- and β-carotene) and tocols (α-tocopherol/T, α-, γ- and δ-tocotrienol/T3) in a temperature-controlled mixer-settler system. The optimal extraction conditions were found at 20°C, 10 min of mixing, 50% of CPO using 3:2 v/v ethyl lactate/ethanol as the solvents. After four stages of extraction, 42.2% of carotenes, 86.7% of tocols and 44.4% of oil were recovered into an oil concentrate of 717.5 mg/L of carotenes and 1496.2 mg/L of tocols.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

T0046 Presentation 13 (17:15~17:30)

The Case of Detention Basin with the Concept of Sponge City
Zoe Lin, Michael Liu, and Hermina Ho
Gold-Joint Industry Co., Ltd, Taiwan

Abstract—This paper presents the design and the result of a case study about using a variety of geosynthetics for building a detention basin, which successfully controls the flood of the nearby area and provides a safe environment for local residents. Located in Taichung, a small city with high populations, how to utilize the decentralized area effectively to solve engineering problems is a difficult topic for discussion. In this case, geosynthetics are used to substitute for concrete in order to form the main structure and also to meet the functional requirements, such as flood control, land use, rainwater management, ecology etc. By the innovative construction method, we combine engineering solutions with the principles of sponge city as well as green engineering, demanding to create a safe, low impaction, ecologically friendly, scenic and sustainable environment.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

T0024 Presentation 15 (17:30~17:45)

Measurements of the Received Signal Level and Service Coverage Area at the IEEE 802.11 Access Point in the Building
N. Gunantara, P. K. Sudiarta, AAN Agung Indra and IN Gde Antara
Universitas Udayana, Indonesia

Abstract—Access point (AP) is part of a Wireless Local Access Network (WLAN) with its communications using WiFi. AP is tasked to transmit and receive data to users/clients. The ability of AP to serve users/clients depends on many factors. Moreover, if AP is applied in conditions inside the building. In this study, AP is installed at two points inside the building and then measured in the form of the received signal level (RSL) and service coverage area. One AP measured its performance by 26 measurement points and the other AP measured its performance by 20 measurement points. When AP has measured its performance then another AP position is switched off. Based on the measurement result, the received signal level value is the highest value is about -47 dBm at a distance of 3.2 m, while the lowest is about -79 dBm at a 9.21 m because it is on barrier 2 walls. While based on service coverage area, the area which is far away from the AP then the quality of service becomes bad because the transmitted signal is weakening caused by the distance and the loss of the wall.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

T0037 Presentation 16 (17:45~18:00)

Sustainable and ICT-Enabled Development in Developing Areas: An E-Heritage E-Commerce Service for Handicraft Marketing

Tufail Muhammad and KwanMyung Kim
Ulsan National Institute of Science & Technology (UNIST), South Korea

Abstract—Human-induced threats serve as potential hazards to cultural heritage assets, especially in developing areas where the local community, in general, is a deprived class. Sustainable tourism development is acknowledged as an economic activity to ensure careful management of assets along with local community empowerment and participation. As such, ICT-enabled development is applied in rural development projects to promote sustainable rural livelihood, but success is still limited due to a lack of community involvement and sharing in the economic gains of tourism. With this perspective in mind, the present study focuses on emerging marketing models (e-commerce) that can provide new business ventures for local communities by identifying critical online marketing elements driven by local residents.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0017 Presentation 17 (18:00~18:15)

Fruit Waste Potential, a Weakness or a Potency, Doing Locally Effect Globally

Setyadjit S., Ermi Sukasih and Risfaheri R.
Indonesian Center for Agriculture Postharvest and Development, Indonesia

Abstract—Liquid and solid waste are claimed as one of source of Green House Gas (GHG) which cause global warming and climate change. Fruit has a potency producing solid waste. To figure out the local fruit waste potential; we correlated the fruit production, the edible portion of the composition of food, published paper, and also our experience in doing postharvest research. Not all fruit has production data, also not all the production data have edible portion. Some of variation of cultivated variety has also been neglected. The figure shows 8 097 938 tonnes of fruit waste annually produced in Indonesia. This value is bigger than annual production of banana which is the biggest fruit produced in Indonesia viz 6 862 567 tonnes. The fruit losses data are unavailable, but this would increase the amount of waste if it the good handling practices failed to be done. The government policy across ministry and across center and local government were produced supporting decree and regulation to preserve the environment. The member of society such as researcher, culinary society, and processor were trying to improve their knowledge to utilize the fruit solid waste. Fruit processing industry both local and abroad facing dynamic pressure and some of them faced difficulty in coping environmental problem. Looking for better solution for potential environmental problem from fruit, it is recommended researching varieties with long storage life; also continuing research on postharvest fruit preservation and transportation, fruit seedless, and continuing to educate small processor, and society to have better understanding of GHG and global warming and how to cope them.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 學海堂 Xue Hai Tang Building (S109)

Session 3 (Part. 2): 11 presentations- Topic: “Agricultural Science and Sustainable Development”

Session Chairs: Prof. Shih-Shiung Chen & Prof. Bo-Ching Chen

A0018 Presentation 18 (18:15~18:30)

Utilization of Rice Husk for Production of Multifunctional Liquid Smoke

R Risfaheri, H Hoerudin and M Syakir

Indonesian Center for Agricultural Postharvest Research and Development, Indonesia

Abstract—Rice husk is an abundant and underutilized byproduct of rice milling industries, especially in main rice producing countries like Indonesia. The current challenge is how to contribute value addition to the rice milling industries by maximizing utilization of the unwanted rice husk. Recently, there has been a growing interest in utilizing rice husk for production of multifunctional liquid smoke. However, limited studies have been done on this aspect. Previous published reviews are mostly focused on development of liquid smoke from different wood varieties/types or palm oil waste. The main objective of this review is to provide a comprehensive review and further research direction regarding potential development and applications of liquid smoke from rice husk based on the limited and scattered information currently available. This review covers production technology, characteristics, functional properties and potential applications of rice husk liquid smoke. The cited findings showed that there are at least four pyrolysis techniques that can be used for production of rice husk liquid smoke. In addition, there are several factors that may influence the quality of the final product. These include modes of pyrolysis (temperature, heating rate, and residence time), biomass composition, and storage condition and period. Each technique and factor can be adjusted and exploited to extract and produce value-added liquid smoke by thermal processing. Rice husk liquid smoke has multifunctional properties, such as antioxidant, anti-inflammatory, antimicrobial and antidiabetic. Composition of major constituents in rice husk liquid smoke determines the magnitude of its functional properties and potential applications. Based on its functional properties, rice husk liquid smoke has a great potential for food and agriculture applications, such as food flavorings, food preservatives, bio pesticides, and plant growth regulator. This review will be valuable for both industries and communities. Utilization of rice husk for production liquid smoke will not only benefit rice milling industries and farmers, but also the environment.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 永續中心Sustainability Center

Poster Session: 4 presentations

T0036 Presentation 1 (14:00~18:30)

Flood Scenario Simulation and Disaster Estimation of Ba-Ma Creek Watershed in Nantou County, Taiwan
S H Peng and Yen-Kun Hsu
Chienkuo Technology University, Taiwan

Abstract—The present study proposed several scenario simulations of flood disaster according to the historical flood event and planning requirement in Ba-Ma Creek Watershed located in Nantou County, Taiwan. The simulations were made using the FLO-2D model, a numerical model which can compute the velocity and depth of flood on a two-dimensional terrain. Meanwhile, the calculated data were utilized to estimate the possible damage incurred by the flood disaster. The results thus obtained can serve as references for disaster prevention. Moreover, the simulated results could be employed for flood disaster estimation using the method suggested by the Water Resources Agency of Taiwan. Finally, the conclusions and perspectives are presented.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 永續中心Sustainability Center

Poster Session: 4 presentations

T0044 Presentation 2 (14:00~18:30)

Study on Cascade Cyclone Calciner in a Pilot-scale Calcium Looping Carbon Capture System

Yiang-Chen Chou, W.C. Chen, C.M. Huang, and H.W. Hsu
Industrial Technology Research Institute, Taiwan

Abstract—The aim of this study was to design and construct a cascade cyclone calciner for sorbent regeneration in a pilot-scale calcium looping carbon capture process. The calciner was designed on the basis of mass and energy balance analysis of a 500kWth system. Effects of flue gas recirculation (FGR), and fuel feeding rate on the sorbent calcination efficiency were investigated. Calculation results determined the capacity of the diesel-fired oxy-combustor applied in the calciner and the geometric dimension of the 500kWth calciner. Experimental results indicated that the flue gas recirculation stabilized the temperature distribution inside calciner. Approximately 200°C temperature gradient through the cascade cyclone calciner was achieved in this study. Both the temperature distribution of flue gas and the migration path of sorbents inside calciner affected the calcination efficiency. The enhancement in flue gas recirculation rate provided more flue gas inventory for sorbent transportation and the increase in fuel feeding rate offered more energy for sorbent calcination. The increases of fuel feeding rate from 46 L/h to 50 L/h and the flue gas recirculation rate from 3380 CMH to 3870 CMH led to almost 4.6 times enhancement in the sorbent calcination efficiency. The calcination efficiency higher than 80% would be realized for experiments using fuel feeding rates higher than 50 L/h.
S0020 Presentation 3 (14:00~18:30)

A Study on Properties of Concrete Using Heavy Weight Waste Glass as Fine Aggregate
So Yeong Choi, Il Sun Kim, San Kim, Yoon Suk Choi and Eunik Yang
Gangneung-Wonju National University, Republic of Korea

Abstract—Concrete is one of the most widely used construction material in the world, and it is a fundamental material nearly all structures. According to the previous research, the necessity for concrete will increase further to almost 7.5 billion m$^3$ a year by 2050 (Rafieizonooz, M., et, al., 2016). The huge quantities of aggregate are used to make the concrete, which is a natural source, however, it is being exhausted. To deal with this situation, many studies proceeded to the development of variety types of aggregate as concrete materials. Especially, several types of industrial waste have been replaced the traditional construction materials. From a wide variety of industrial waste, heavy weight waste glass is considered the most suitable substitute as an aggregate due to its physical characteristics and chemical composition (Tan, K.H., Du, H., 2013). Furthermore, earlier work has shown that recycled glass may be suitable for use in a wide range of applications including concrete, bricks and in road engineering project. Thus, in this paper, we investigate the effect of heavy weight waste glass on the mechanical properties of a concrete specimen as a fine aggregate according to the substitution ratio.
Afternoon, November 25, 2017 (Saturday)

Time: 14:00~18:30

Venue: 永續中心Sustainability Center

Poster Session: 4 presentations

S0021 Presentation 4 (14:00~18:30)

Study on Stability Characteristics of Green Shotcrete Soil Using Mineral Additives

So Yeong Choi, Il Sun Kim, Gyung Jong Lee, Yoon Suk Choi and Eun Ik Yang
Gangneung-Wonju National University, Republic of Korea

Abstract—In this paper, the soil runoff process on the slope surface of green shotcrete soil is compared using the rainfall simulator. From the test results, the hardness of the shotcrete soil is reached 23mm, the soil hardness increment was stopped. So, when the hardness is reached to certain lever limit, there was no additional increment of hardness. And, surface runoff increased with decrease of angle of test bed. That is, the soil resistance capacity according to reduction of angle (range 45° to 70°) of test bed was significantly decreased.
One Day Visit

November 26, 2017 (Sunday) 8:00~17:00

(Tip: Please arrive at the lobby of Nice Prince Hotel before 8 a.m. The following places are for references, and the final schedule should be adjusted to the actual notice.)

1. (8:00) Assemble at the lobby of Nice Prince Hotel, Leaving for Nanhua University

2. (08:50-10:10) Visiting Sustainability Center - Weather Station - Healing Garden

**Sustainability Center:** College of Science and Technology in Nanhua University was chartered in 1996. Our college is devoted to utilize the current newest technology to build the teaching environment combining academic theory with pragmatic experience, and then further cultivate the talented students owning high technical knowledge. The college is comprised of two graduate institutes and four departments which focus on information technology, communication, electronic commerce, biotechnology, natural healing sciences, etc. We will keep driving the related industries into our college and create other related academic units following the newest trends in the future.

**Healing Garden:** The main function of a healing garden include: To reduce long-term stress, to feel consoled, hopeful, inspired, and encouraged. The design of the therapeutic landscape should have the following characteristics: easily accessible, diverse in plant types, rich in color, promote human-plant relationship and interaction, and consist of plants with various shapes and sizes that stimulate the senses. Horticultural therapy is the use of plants and therapeutic landscapes to rehabilitate one’s physiological, mental and spiritual wellbeing. By undertaking horticultural activities, one will be able to develop a sense of purpose, hope, expectation, achievement and enjoyment, and thus, begin to better understand oneself and the surrounding environment.

3. (10:10-10:30) Coffee Break

4. (10:30-11:30) Meditation

Meditation is a practice where an individual operates or trains the mind or induces a mode of consciousness, either to realize some benefit or for the mind to simply acknowledge its content.
without becoming identified with that content, or as an end in itself. Meditation may involve generating an emotional state for the purpose of analyzing that state—such as anger, hatred, etc.—or cultivating a particular mental response to various phenomena, such as compassion. The term "meditation" can refer to the state itself, as well as to practices or techniques employed to cultivate the state. Meditation may also involve repeating a mantra and closing the eyes. The mantra is chosen based on its suitability to the individual meditator. Meditation has a calming effect and directs awareness inward until pure awareness is achieved, described as "being awake inside without being aware of anything except awareness itself. In brief, there are dozens of specific styles of meditation practice, and many different types of activity commonly referred to as meditative practices.

5. (11:30-13:00) Having lunch together

6. (13:00-13:50) Leaving for Southern Branch of the National Palace Museum

7. (13:50-17:00) Visiting Southern Branch of the National Palace Museum

The NPM Southern Branch is located in Chiayi County, just 3km from Chiayi's High Speed Rail station. The museum is set on 70 hectares of land and in addition to the museum building there are also a large scenic lake and Asian-style gardens. The Chiayi government has called this "the most important cultural project in the history of Chiayi, playing an especially decisive role in the development of culture, tourism, and the economy in Chiayi City and surrounding areas." The NPM, oft described as the world's greatest repository of Chinese cultural treasures, is located in Taiwan's far north, and the Southern Branch is being opened to enable residents of the south to share in its resources.

Yet the expanded NPM will be much more than this. The director of the NPM, Feng Ming-Chu (馮明珠), describes it as a gift to all of Asia. The ancient Chinese culture has not developed in isolation. The Southern Branch is a showcase celebration of the almost ceaseless cross-pollination that has added to the luster of each civilization across Asia, with particular focus on the Chinese, Indian, and Persian, she explained further during a recent sit-down with Travel in Taiwan.

8. (17:00-17:30) Back to Nice Prince Hotel
Conference Venue

Nanhua University, Taiwan

http://www.nhu.edu.tw/

No.55, Sec. 1, Nanhua Rd., Dalin Township, Chiayi County 62249, Taiwan

Nanhua University (NHU; Chinese: 南華大學) is a university located in Dalin Township, Chiayi County, Taiwan. Founded in 1996 as the Nanhua College of Management, it was elevated to university status in 1999. The university was founded by the Buddhist monk Hsing Yun of Fo Guang Shan. It is adjacent to National Chung Cheng University.

Nearby hotels recommendation:

1. Nice Prince Hotel / 嘉义耐斯王子大饭店 (http://www.niceprincehotel.com.tw/index_e.aspx)
   If you would like to book this hotel, you can enjoy the discounted price with your paper acceptance letter or invitation letter. For the detailed price information, please kindly contact the conference email address (sdgt@cbees.net). Please note that the conference email address only answers the price information instead of room booking. (For hotel booking, please contact the hotel director by email: n001203@mail.janfusun.com.tw)

   If you would like to book this hotel, please kindly book it through the hotel's official website or other normal accommodation booking platform. Please note that there is no discounted price for this hotel.
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