CONFERENCE ABSTRACT

2019 2nd International Conference on Electronics and Electrical Engineering Technology (EEET 2019)

Sains@USM, Block C, Universiti Sains Malaysia, Penang, Malaysia

September 25-27, 2019

Co-Organized by

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Introduction

Welcome to 2019 2nd International Conference on Electronics and Electrical Engineering Technology (EEET 2019) which is co-organized by Biology and Bioinformatics Society (BBS) under Hong Kong Chemical, Biological & Environmental Engineering Society (CBEES), Collaborative Microelectronic Design Excellence Centre (CEDEC) and Universiti Sains Malaysia (USM); supported by Tiangong University and TT Vision. The theme for the conference is "Engineering Next Generation Technology for Humanity". EEET conference series is annually held. In 2018, EEET held successfully in Tiangong University (Tianjin Polytechnic University), Tianjin, China with about 120 participants from all over the world. The goal of this conference is to bring together the researchers from academia and industry as well as practitioners to share ideas, problems and solutions relating to the multifaceted aspects of Electronics and Electrical Engineering Technology.

Papers will be published in one of the following conference proceedings or journals:

Conference Proceedings by ACM (978-1-4503-7214-5): archived in ACM Digital Library, indexed by **Ei Compendex** and **Scopus**, and submitted to be reviewed by Thomson Reuters Conference Proceedings Citation Index (ISI Web of Science).

or

Some excellent papers will be recommended to the "**Special Issue on Engineering Next Generation Technology for Humanity**" in International Journal of Electrical and Electronic Engineering & Telecommunications (IJEETC, ISSN: 2319-2518): indexed in **Scopus** (since 2017), Google Scholar, Crossref, Citefactor, etc.

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

Presentation Instruction

Instruction for Oral Presentation

Devices Provided by the Conference Organizer:

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

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):

Keynote Speech: about **30** Minutes of Presentation and **5** Minutes of Question and Answer
Oral Presentation: about **12** Minutes of Presentation and **3** Minutes of Question and Answer

Instruction for Poster Presentation

Materials Provided by the Conference Organizer:

The place to put poster

Materials Provided by the Presenters:

Home-Made Posters: Submit the poster to the staff when signing in
Poster Size: A1 (841*594mm)
Load Capacity: Holds up to 0.5 kg

Best Presentation Award

One Best Presentation will be selected from each session, and the Certificate for Best Presentation will be awarded at the end of each session on September 26, 2019.

Dress Code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introduction

Keynote Speaker I

Prof. Wuqiang Yang

The University of Manchester, UK

Prof. Wuqiang Yang is a Fellow of the IET (formerly IEE), Fellow of the Institute of Measurement and Control and Fellow of the IEEE. He was also an IEEE IMS Distinguished Lecturer (2010-2016) and JSPS Invitation Fellow (2016). Since 1991, he has been working with The University of Manchester (formerly UMIST) in the UK and became Professor of Electronic Instrumentation in the School of Electrical and Electronic Engineering in 2005. His main research interests include industrial tomography, especially electrical capacitance tomography (ECT), inverse problem and image reconstruction, instrumentation and multiphase flow measurement. He has published over 500 papers, is a referee for over 50 journals (including 6 IEEE journals), Associate Editor of IEEE Trans. on Instrumentation and Measurement, editorial board member of 6 other journals (including Meas. Sci. and Technol.), guest editor of many journal special issues and visiting professor at several other universities. His biography has been included in Who's Who in the World since 2002.

Topic: "Electrical Capacitance Tomography and Industrial Applications"

Abstract—Among various industrial tomography modalities, electrical capacitance tomography (ECT) is the most mature and has been used for many challenging applications. ECT is based on measuring very small capacitance and reconstructing the permittivity distribution in a cross section of an industrial process, such as a multiphase flow or a fluidised bed. The internal information obtained by ECT is valuable for understanding complicated phenomena, verifying CFD models and simulation results, measurement and control of complicated processes. Compared with other tomography modalities, ECT has several advantages of no radioactive, fast response, both non-intrusive and non-invasive, withstanding high temperature and high pressure and of low-cost. Because of very small capacitance to be measured (down to 0.0001 pF) and the "soft-field" nature, ECT does present challenges in circuit design, solving the inverse problem and re-engineering. Our latest AC-based ECT system can generate online images at 300 frames per second with a signal-to-noise ratio (SNR) of 73 dB. Examples of industrial applications include the measurement of gas/oil/water flows, wet gas separation, pneumatic conveyors, cyclone separators and fluidised beds for pharmaceutical manufacturing and clean use of coal by

circulating fluidised bed combustion and methanol-to-olefins conversion. During this talk, ECT will be discussed from principle to industrial applications, together with a demonstration of an AC-based ECT system.

Keynote Speaker II

Prof. Chee Peng Lim
Deakin University, Australia

Prof. Lim Chee Peng completed his Ph.D. degree at the Department of Automatic Control and Systems Engineering, University of Sheffield, UK, in 1997. His research focuses on the design and development of computational intelligence-based systems for data analytics and decision support, with application to medical prognosis and diagnosis, fault detection and classification, and manufacturing process optimisation. He has published over 450 technical articles in journals, conference proceedings, and books, and received 8 best paper awards in international conferences. He has also received many prestigious fellowships for international research collaboration, viz., Australia-India Senior Visiting Fellowship (by Australian Academy of Science), Australia-Japan Emerging Research Leaders Exchange Program (by Australian Academy of Technology and Engineering), Commonwealth Fellowship (at University of Cambridge), Fulbright Fellowship (at University of California, Berkeley), and Visiting Scientists Program of Office of Naval Research Global, USA (at Harvard University and Stanford University). In collaboration with co-workers, he has developed innovative software systems that have won various awards, which include Gold Medal at Pittsburgh Invention and New Product Exposition, USA, Gold Medal and Special Award at British Innovation Show, UK, Gold Medal at Geneva International Exhibition of Inventions, Switzerland, and Silver Prize at Open Source Software World Challenge, South Korea.

Topic: "Artificial Intelligence (AI)-based Systems for Biomedical Data Analytics and Decision Support"

Abstract—AI-based systems exhibit several key characteristics of human intelligence, e.g. learning, adaptability, reasoning, and decision making. In this talk, two aspects of designing and developing AI-based systems for data analytics and decision support applications are elucidated, viz., how to engineer computerised intelligent systems with an autonomous learning capability and how to reveal knowledge acquired by the intelligent systems for human reasoning and decision making. Specifically, single and hybrid data-based learning algorithms, which include neural, fuzzy, and evolutionary computational paradigms, are exploited. The importance of incremental learning without suffering from the catastrophic forgetting problem in perpetual data-based learning environments is highlighted. In addition, a human-in-the-loop framework that allows users to interact with the developed AI-based systems is formulated. This framework is crucial for users to understand the predictions

yielded by the AI-based systems and, at the same time, to incorporate human knowledge, experience, and preference into the underlying learning algorithms during the operation stage. Application of the resulting AI-based systems to a range of image processing, pattern recognition, and decision support problems in biomedical and healthcare application domains will be demonstrated.

Keynote Speaker III

Prof. M. Iqbal Saripan
Universiti Putra Malaysia, Malaysia

Prof. M. Iqbal Saripan is a professor in the area of digital image processing from Universiti Putra Malaysia. He completed his PhD from the University of Surrey, United Kingdom in 2006. He is currently the Deputy Vice Chancellor (Academics and Internatonal), Universiti Putra Malaysia since February 2017. He was the recipient of Top Research Scientist Malaysia (TRSM), 2013 National Young Scientist Award and 2012 The Young Outstanding Malaysian Award (TOYM). Recently in 2016, he has received an alumnus of the year for University of Surrey. He was listed as Top Ten Creative Young Malaysian by Top Ten Magazine in 2015. In January 2013, Elsevier awarded him as the Most Valued Reviewer for Radiation Physics and Chemistry Journal. Other selected awards in his list are; the Travel Bursary Award ISRP Melbourne (International Radiation Physics Society), twice the Best Paper Award in San Francisco and London, GOLD medal in Geneva, GOLD medal in PECIPTA, SILVER in MTE, UPM Excellent Young Researcher Award and UPM Excellent Consultant Award. Iqbal is currently a Chartered Engineer with Engineering Council UK since 2015. He is active in his learned societies in his area. Currently, he is the Vice Chairman of International Radiation Physics Society (IRPS) which members are the prominent figures in the area of radiation physics. Apart from that, he has also served Institute of Electrical and Electronics Engineers (IEEE) at various positions – chairman, vice chairman and executive committee members over the years. At national level, he is currently a treasurer of Young Scientist Network (YSN). His research area focusses on medical image processing, particularly in nuclear medical imaging of cells activities detection, which includes cancer and Alzheimer. He has published more than 100 journal papers in flagship & impact journal journals, such as IEEE Transactions on Nuclear Science, IEEE Transactions on Biomedical Engineering, Nuclear Instruments and Methods, and Radiation Physics and Chemistry. His total number of publications exceeds 250 papers. His research has been funded by more than RM10million from various national and international sources.

Topic: "Imaging the Unseen"

Abstract—Imaging and picturing have become the norm of our daily lives. With the advancement of image processing technology, the boundary of what image processing can do, is further extended. There are a lot of applications for image processing now. One of the most important areas is in medical field. Image has started to be used previously in a simple

medical observation, e.g. fracture detection and infection. As time passes by, more information can be extracted from the image. Often times, the captured images were internal structures that hidden inside the body. It requires a modern imaging technology to image the internal structure more accurately. Despite the more sophisticated imaging devices, the same old problem haunted the output images, i.e. noise. This talk will focus on the aspect of noise reduction, so that the details in the images can be preserved. Noise for nuclear imaging apparatus such as gamma camera, single photon emission tomography (SPECT) and position emission tomography (PET), can influence the overall quality of the image. Hence, noise need to be handle with care, especially when it comes to become the decision factor.

Keynote Speaker IV

Prof. Ming Chen
Zhejiang University, China

Prof. Ming Chen received his PhD in Bioinformatics from Bielefeld University, Germany, in 2004. Currently he is working as a full Professor in Bioinformatics at College of Life Sciences, Zhejiang University. His group research work mainly focuses on the systems biology, computational and functional analysis of non-coding RNAs, and bioinformatics research and application for life sciences. Prof. Chen is serving as an academic leader in Bioinformatics at Zhejiang University. He chairs the Bioinformatics society of Zhejiang Province, China. He is a committee member of Chinese societies for "Modeling and Simulation of Biological Systems", "Computational Systems Biology", "Functional Genomics & Systems Biology" and "Biomedical Information Technology".

Topic: "Bioinformatics Approaches for Sing Cell Omics Data Analysis"

Abstract—With the rapid development of information technology and biological technology, multi-omics data is available, which brings us a challenge to develop appropriate bioinformatics approaches to model complex biological systems at spatial and temporal scales. We were motivated to characterize coding and non-coding RNAs including microRNAs, siRNAs, lncRNAs, ceRNAs and cirRNAs. An integrative interactome model of non-coding RNAs is built. Moreover, single-cell RNA sequencing makes it possible for bioinformatics to reveal expression patterns at the cellular level. We introduced a transcriptome-based single-cell atlas, and a web-based pipeline that accurately defines cell types based on single-cell digital expression. Additionally, we mined key factors of lncRNA regulating renal tumor metastasis based on single-cell RNA-seq data.

Keynote Speaker V

Assoc. Prof. Bee Ee Khoo
Universiti Sains Malaysia, Malaysia

Assoc. Prof. Bee Ee Khoo received her PhD in Robotic Vision from University of Wales, Swansea. Currently she is working as an associate professor in School of Electronic & Electrical Engineering, Universiti Sains Malaysia. Her research work mainly focuses on digital watermarking, forensic engineering and computer vision. She is a lifetime member of SPIE and a Senior Member of IEEE. She has published numerous articles in leading journals, book/book chapters and international conferences. She regular serves as reviewer, and TPC member of many international journals and conferences.

Topic: *"Security Analyses of Singular Value Decomposition(SVD)-Based Digital Watermarking"*

Abstract—Digital watermarking is the process of concealing secret information, called watermark, in a digital medium. There are many criteria to consider when choosing a watermarking scheme. These include imperceptibility, robustness as well as capacity. SVD-based watermarking can offer good imperceptibility, robustness and high capacity. Hence there are many watermarking techniques are being proposed based on SVD. However a common weakness is that SVD-based watermarking is possible to suffer false positive problem(FPP). Satisfying robustness and imperceptibility requirements, as well as preventing FPPs, in SVD-based image watermarking is crucial in applications such as copyright protection and authentication. During this talk, the false positive problem of SVD-based watermarking techniques will be demonstrated and possible solutions of overcome it will be discussed.

Brief Schedule of Conference

Day 1 September 25, 2019 (Wednesday)	10:00-17:00	**Venue: Lobby of Auditorium Ishak Pateh Akhir (Ground Floor)** **Participant Onsite Registration & Conference Material Collection**
Day 2 September 26, 2019 (Thursday)		**Venue: Auditorium Ishak Pateh Akhir (Ground Floor)**
	09:00-09:05	**Opening Remarks** Prof. Mohd Fadzil Mohd Ain
	09:05-09:40	**Keynote Speech I** Prof. Wuqiang Yang The University of Manchester, UK Topic: "Electrical Capacitance Tomography and Industrial Applications"
	09:40-10:15	**Keynote Speech II** Prof. Chee Peng Lim Deakin University, Australia Topic: "Artificial Intelligence (AI)-based Systems for Biomedical Data Analytics and Decision Support"
	10:15-10:40	**Coffee Break & Group Photo**
	10:40-11:15	**Keynote Speech III** Prof. M. Iqbal Saripan Universiti Putra Malaysia, Malaysia Topic: "Imaging the Unseen"
	11:15-11:50	**Keynote Speech IV** Prof. Ming Chen Zhejiang University, China Topic: "Bioinformatics Approaches for Sing Cell Omics Data Analysis"
	11:50-12:25	**Keynote Speech V** Assoc. Prof. Bee Ee Khoo Universiti Sains Malaysia, Malaysia Topic: "Security Analyses of Singular Value Decomposition(SVD)-Based Digital Watermarking"

Day 2 September 26, 2019 (Thursday)	**12:25-13:30 Lunch** **Lower Ground Floor**
	Session 1: 13:30-15:15 **Venue: Seminar Room 2 (Lower Ground Floor)** Topic: "Electronic Engineering" 7 presentations **Session 2**: 13:30-15:15 **Venue: Seminar Room 3 (Lower Ground Floor)** Topic: "Bioengineering" 7 presentations
	15:15-15:45 Coffee Break **(Lower Ground Floor)**
	Session 3: 15:45-17:30 **Venue: Seminar Room 2 (Lower Ground Floor)** Topic: "Electronical Hardware Technology" 7 presentations **Session 4**: 15:45-17:15 **Venue: Seminar Room 3 (Lower Ground Floor)** Topic: "Communication and information system" 6 presentations
	Poster Session: 13:30-17:00 **Venue: Seminar Room 2**
	18:00-20:00 Dinner Banquet **Lower Ground Floor**
Day 3 September 27, 2019 (Friday)	**9:00-17:30** **Academic Visit**

Tips: Please arrive at the Conference Room 10 minutes before the session begins to upload PPT into the laptop; submit the poster to the staff when signing in.

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, September 26, 2019 (Thursday)
Time: 13:30-15:15
Venue: Seminar Room 2 (Lower Ground Floor)
Topic: "Electronic Engineering"
Session Chair: Prof. Hirohide Haga

M3002 Session 1 Presentation 1 (13:30-13:45)	Construction of Standardization Method of Estimated Power Consumption System by Driving of Electric Vehicle using Geographic Information System and User's Driving Data **Atsushi Shiota**, Shuntaro Nakayama, Hiroki Iwai, Keita Tsuruhara, Thongchart Kerdphol and Yasunori Mitani Kyushu Institute of Technology, Japan *Abstract*—In recent years, global warming is increasing due to the influence of greenhouse gas such as carbon dioxide. Therefore, in the automotive field, emission control has been conducted. Then, automakers are focusing on the EV development. This development still has some concern problems such as a short-distance driving range, long-period charging time, and small amount of charging infrastructure compared with the internal combustion engine vehicle. In addition, EV offers a special feature such as regenerative braking systems. Accordingly, our research team has used the Geographic Information System, road networks, elevation models, and EV driving data to derive the equations of estimated power consumption for each vehicle type individually. The driving support system that manages electric power of EV using this formula is constructed. This research standardized the derivation method of estimated power consumption formula based on previous research achievement. Furthermore, this research constructed a mechanism to collect driving data of the user, reviewing the estimated power consumption formula after the EV was sold. In the accuracy verification of the estimated power consumption, the estimated value calculated by the system was compared with the measured value and the WLTC value. As a result, it was confirmed that to reduce the error.
M3010 Session 1 Presentation 2	Design of an Educational Electronic Game System **Bokani Mtengi**, Adamu Murtala Zungeru, Phalaneng Maphane and Joseph Chuma Botswana International University of Science and Technology, Botswana

(13:45-14:00)	*Abstract*—The dynamics of learning have evolved over time and continue to change to date because of several reasons that include but not limited to competition for time between formal school curriculum learning and entertainment media such as television and social media, and the growing student teacher ratio that limits interaction of the teacher and his/her students, and as such the notion of a teacher attending to different unique needs of his/her learners remains a pipeline dream for most African governments. As such, we design a system that performs mathematical operation involving addition, subtraction, multiplication, and division (4 mathematical operations) whereby the person who has the highest score will win the game. The system is divided into different sub-circuits. This division includes; Power supply, user input, timing circuit, counter circuit, and display circuits. In the end, a successful prototype was built using an efficient and simple circuit.
M2016 Session 1 Presentation 3 (14:00-14:15)	Point Spread Function Estimation for Neutron Images **Khairiah Yazid** and Mohd Zaid Abdullah Universiti Sains Malaysia, Malaysia *Abstract*—The neutron images produced by small power reactor like TRIGA MARK II PUSPATI research reactor (RTP) are inherently blurred due to low length-to-diameter ratio (L/D) at the neutron radiography facility. Hence, restoration is commonly undertaken in order to improve the visual quality of these image. However, point spread function (PSF) which is responsible for blurring is usually unknown, thus making the restoration a difficult process. Assuming the target is radially symmetrical for a given size and shape, the PSF can still be estimated with acceptable degree of accuracy. In this paper, an edge spread function (ESF) is used for PSF estimation, while the restoration is achieved by means of non-blind Richardson-Lucy (RL) deconvolution. Experiments show that the algorithm improves the overall quality of the image both visually and in terms of peak noise ratio (PSNR).
M3015 Session 1 Presentation 4 (14:15-14:30)	Multiple-Input Single-Output Boost Converter T. Taufik, J. W. Baltierrez and **Rini Nur. Hasanah** Universitas Brawijaya, Indonesia Abstract—This paper presents a multiple-input single-output converter for the DC House project. The proposed architecture allows for multiple different input sources to supply power to a single higher power output. The design uses a boost converter with a parallelable output which has been demonstrated to allow increased total output power as a function of the number of input sources available. The parallelable output has been shown to distribute load amongst the input sources relatively to optimize the system. This approach is also desirable since it allows for flexibility in multiple configurations. The design was tested using hardware and data results show the performance met and exceeded the needs of the DC

	House project. Data were taken for configuration with 1, 2, 3, and 4 input sources providing greater than 600W of total output power at an efficiency of greater than 92%. This architecture demonstrates the possibility of expanding the total available power for a single output in proportion to the number of available input sources.
M2014 Session 1 Presentation 5 (14:30-14:45)	Comparative Control Strategy of Asymmetric Bridge Converter for Switched Reluctance Motor **Agus Adhi Nugroho**, Bhakti Yudho Suprapto, Muhamad Haddin and Zainuddin Nawaw Universitas Sriwijaya, Indonesia *Abstract*—Switched Reluctance Motor has many advantages such as high efficiency, starting torque and reliability, simple construction, robustness, and low maintenance become the best achievement of this motor, but there is still major drawback like large torque ripple, acoustic noise and vibration. This paper present the comparative strategic in controlling of Switched Reluctance Motor using asymmetric bridge converter base on magnetizing-demagnetizing mode and magnetizing-freewheeling mode applied on 6/4 Switched Reluctance Motor using Matlab/Simulink. The comparison between the magnetizing demagnetizing and magnetizing freewheeling started with increasing the turn on angle while keep the turn off angle constant and run the simulation until the highest speed reached, then the turn on angle kept constant while the turn off angle increased until high speed reached. The result of the paper is that the asymmetric bridge converter under magnetization demagnetizing achieve better performance in reaching higher speed, and more efficient since draw the smaller current, and the top speed catch earlier compare to the magnetizing freewheeling mode.
M3012 Session 1 Presentation 6 (14:45-15:00)	Design of an Enhanced Hit the Target Game **Bokani Mtengi**, Adamu Murtala Zungeru, Diarra Bakary and Joseph Chuma Botswana International University of Science and Technology, Botswana *Abstract*—In underdeveloped countries, many children do not have access to modern toys due to poverty. The situation often leads children to play outside without any supervision. Exposing them to threats such as safety, accidents and peer pressure led bad behavior. This creates the need to design cost-effective toys which can be purchased by any parent. The solution proposed in this work is to design a hit the target game for entertaining. The expectation of the game is to get as many children as possible interested in it without being costly for a typical underdeveloped country parent. For these reasons, this game uses Light Emitting Diodes (LEDS) and push buttons. The proposed circuit is based on the combination of a few simple integrated circuits (ICs) and analog components which are efficient and light to be carry around. The device

	comprises of three main parts being the power supply which can be any common 5V battery, the control block comprising two LM555 timers permitting to start and stop the game and the moving targets represented by LEDs lit by an IC4017 decade counter. The complexity of the game is controlled by a potentiometer which varies the LEDs frequency, by changing the probability of hitting a target.
M2005 Session 1 Presentation 7 (15:00-15:15)	A Differential Cross-Coupling Common Gate Low Noise Amplifier (LNA) for MedRadio Band Application **Arjuna Marzuki**, Chiong-Xun Kong and Mutanizam Abdul Mubin Universiti Sains Malaysia, Malaysia Abstract—In this paper, we present an ultra-low-power low noise amplifier (LNA) for MedRadio band application. The LNA in this paper is known as differential cross-coupling common gate amplifier. The main structure of the design is the common gate configuration amplifier. A new technique such as cross-coupling technique is integrated to improve the gain and noise figure of the amplifier. The differential topology is finally implemented to improve the overall performance of the LNA. The final LNA is implemented in CMOS by using Silterra's CMOS 180 nm technology. The LNA is designed with voltage supply equal to 1 V. The current consumption is equal to 0.2 mA. Therefore, the overall power consumption of the LNA is equal to 0.2 mW. Apart from this, the final simulated power gain for complete differential cross-coupling common gate amplifier is equal to 17.2 dB, and the simulated noise figure is equal to 5.4 dB. The designed LNA can operate from 80 MHz to 800 MHz. In addition, MOSCAPs are used to replace all the conventional passive capacitors in order to reduce the overall area of the LNA. Comparison of

Session 2

Afternoon, September 26, 2019 (Thursday)
Time: 13:30-15:15
Venue: Seminar Room 3 (Lower Ground Floor)
Topic: "Bioengineering"
Session Chair: Prof. Chee Peng Lim

M0002 Session 2 Presentation 1 (13:30-13:45)	Self-Assembled DNA Nanoclaws for Targeted Delivery of Doxorubicin to MCF-7 Cells **Si Sun**, Qian-Ru Xiao and Yong Jiang Southeast University, China *Abstract*—Cancer therapy is an important issue for scientific research. In this study, inspired by the structure of raptors' claws, we designed an aptamer-functionalized multivalued DNA assembly for targeted delivery of doxorubicin (Dox) to MCF-7 breast cancer cells. The assemblies were fabricated via a simple process of DNA base pairing: eight DNA single strands including five aptamer-ended strands and two complementary strands were applied. It was found that DNA nanoclaws could load Dox with high drug-loading capacity and the Dox-loaded nanoclaws assisted cellular internalization. Furthermore, Dox-loaded DNA nanoclaws could specifically bind the MCF-7 cells with the help of the aptamer AS1411. This study provided a DNA constructing platform to produce new drug carriers with high drug-loading capacity for targeted drug delivery to cancer cells.
M0003 Session 2 Presentation 2 (13:45-14:00)	Convolutional Neural Network Based Deep Feature Learning for Finger-Vein Identification **Manjit Singh** and Sunil Kumar Singla Thapar Institute of Engineering and Technology, India *Abstract*—The modern-day finger vein based human recognition techniques provide good performance, yet they are highly finger vein image quality dependent. To address this problem, a novel deep learning-based approach using convolution-neural-network (CNN) for finger vein identification has been introduced here. The prime objective of our work is to achieve a stable response with accurate performance keeping varying quality finger vein images in account. The proposed approach is tested on the considered publicly available dataset and reported experiment results show that with effective training and testing

	strategy high identification accuracy can be achieved.
M0008 Session 2 Presentation 3 (14:00-14:15)	Structural Analysis to Evaluate The Design of a Synthetic Mitral Valve Prosthesis **Ranjitha Rebecca Jeevan** and Bhaskar Mohan Murari Vellore Institute of Technology, India *Abstract*—Synthetic heart valves restore the functioning of a diseased valve better than mechanical and biological valves. Its biocompatibility and superior flexibility is a preferred for the replacement of diseased mitral valve. Considering the anatomical and hemodynamic limitations of the mitral valve, synthetic valves will be able to perform better than mechanical or biological valves. In this computational study, models of segmented polyurethane valves with varying leaflet configuration were designed. The bileaflet, trileaflet and quadrileaflet models were subjected to linear structural analysis to determine the durability and flexibility. The leaflet models were simulated to operate against the transvavular pressure gradient of 30mmHg (systolic pressure) and 120mmHg (diastolic pressure). The outputs in the form of von Mises stress distribution pattern for each of the leaflet model was obtained. The trileaflet and quadrileaflet configurations showed better functionality in comparison to the bileaflet valve. The outcome of this study would be the basis for the development of a low profiled, transcatheter mitral valve replacement device with better durability and flexibility.
M0014 Session 2 Presentation 4 (14:15-14:30)	Anterior Cruciate Ligament (ACL) Coronal View Injury Diagnosis System using Convolutional Neural Network **M. Hanif. Razali**, S. M. Sazwan, Maizatuljamny Mahmood, Duratul'ain Nazri, Jawad. Ali and Mohd Zaki Ayob Universiti Kuala Lumpur British Malaysian Institute, Malaysia *Abstract*—ACL injury is one of the most common injuries in sports activities or events. Failure to detect it would endanger the athletes' future. In this research, knee joint magnetic resonance imaging (MRI) is studied for the development of a computer-aided system to classify ACL injury. This work aims to develop a deep learning system applying Convolutional Neural Network (CNN) with Confusion Matrix analysis to assist medical experts in making decisions regarding the types of an ACL knee injury in the form of a classification based on complete tear (CT), a partial tear (PT) and normal or non-injury classes. 360 knee MRI images (coronal view) were used to develop an alternative feature extraction and classification technique in deep learning as compared to existing automated system. The result of confusion matrix analysis accuracy of the classification of ACL injury is 94.7%.
M0015	The Enzyme that Reduces Oxidized Cytoglobin in Bovine Liver: An Exploration **Nabilla Sonia Sahara**, Mohamad Sadikin and Sri Widia A. Jusman

Session 2 Presentation 5 (14:30-14:45)	Universitas Indonesia, Indonesia *Abstract*—Oxidized cytoglobin (Cygb) can be reduced by supernatant of bovine liver cell homogenate as demonstrated by increased production of Cygb-Fe2+ from Cygb-Fe3+. We hypothesized that, in bovine liver tissue, there is a protein that acts as reductase, which is analogous to diaphorase, acting on methemoglobin (metHb), and analogous to cytochrome b5 reductase 3 (CYB5R3), acting on metmyoglobin (metMb). The aim of this study is to explore the enzyme that can reduce oxidized Cygb to reduced Cygb. The putative enzyme in bovine liver homogenate was isolated using RIPA lysis buffer, purified by Cibacron blue chromatography, and confirmed by SDS-PAGE and western blot. The activity of the suspect reductase enzyme was determined by the ratio of maximum absorbance between Cygb-Fe3+ (metCygb) and Cygb-Fe2+ (deoxyCygb). We discovered that the reducing capacity of fraction, purified by Cibacron blue chromatography, was weaker than the cell extracted from bovine liver. The gel electrophoresis analysis indicated that the Cibacron blue fraction molecular weight was ~50 and ~60 kDa, whereas CYB5R3 was 34 kDa. Moreover, metcytoglobin could not be reduced by diaphorase. We concluded, there is a reductase enzyme in the cell extract that can reduce Cygb-Fe3+ to Cygb-Fe2+; however, it is neither diaphorase nor CYB5R3.
M0020 Session 2 Presentation 6 (14:45-15:00)	Multiple Feature Point Discriminant Analysis and Its Application to Feature Extraction **Lijun Yan**, Junbao Li and Ying Zhou Shenzhen Information Institute of Technology, China *Abstract—I*n this paper, a novel linear subspace learning approach, named Multiple Feature Point Discriminant Analysis (MFPDA), is proposed. MFPDA is in order to maximize the multiple feature point between class scatter and minimize the multiple feature point within-class scatter. Some experiments are performed on FKP database, AR face database, and ORL face database to evaluate the effectiveness of the proposed MFPDA. Compared with some popular subspace learning methods, such as PCA, LDA, LLP, UNDFLA, JSPCA, the proposed MFPDA has highest average recognition accuracy. The experimental results confirm the effectiveness of the proposed algorithm.
M1006 Session 2 Presentation 7 (15:00-15:15)	In Vitro Self-Assembly of Human Type-I and Type-III Collagen **Esma Eryılmaz** and Wonmuk Hwang Selcuk University, Turkey Abstract—Collagens represent the major structural protein in the human body. Type-I and type-III collagen, which are the most abundant respectively, play an important role in tissue strength with fibrillar network structure resulted from the self-assembly. From the medical point

of view, many diseases are found to be related in an accelerated amount of type-III collagen or its mutations leading to a modified self-assembly resulting in disrupted functionality. We, therefore, in this study, tried to understand the nanoscale mechanism of in vitro self-assembly of human type-I and type-III collagens extracted from placenta using high resolution atomic force microscopy. We also analyzed the sequential distribution of their primary alpha chains to interpret the experimental results and to understand the contribution of electrostatics, hydrophobic, and hydrophilic interactions to the assembly process. We found that, despite very small differences in sequences of bovine and rat with human collagens, their assembled network structure and dimensions of fibrils are quite different. The results show that amino acid sequence of collagen molecules can be modified to produce scaffolds with various patterns and sizes.

15:15-15:45	Coffee Break

Session 3

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, September 26, 2019 (Thursday)
Time: 15:45-17:30
Venue: Seminar Room 2 (Lower Ground Floor)
Topic: "Electronical Hardware Technology"
Session Chair: Assoc. Prof. Rini Nur Hasanah

M2003 Session 3 Presentation 1 (15:45-16:00)	Hardware Security - Present and Future Trends **Rekha S S** and Nagamani A N PES University, India *Abstract*—An Intellectual Property (IP) in Very Large Scale Integrated (VLSI) is a reusable logic unit or functionality or a cell or a layout design that is developed with the creative or innovative idea of licensing to multiple vendors which can be used in their design. Due to globalization of Integrated circuit (IC) design flow, dishonest people in the supply chain can pirate IC's, overbuild IC's, counterfeiting and insert hardware Trojans. Looking into these issues, security of such devices becomes a major challenging job. This paper gives the survey of various methods presented by researchers to secure the innovated design from the third party. The paper is concluded with a need for research in machine learning or deep learning based methodologies for hardware security in IC/IP.
M3005 Session 3 Presentation 2 (16:00-16:15)	Clock Generator with Exponentially Increasing Frequency using Switched-Capacitor Circuit **Aatiqah Aziz**, Shinya Terada, Kei Eguchi and Ichirou Oota National Institute of Technology, Japan *Abstract*—Charging and discharging waveforms in an RC circuit are changed exponentially. The change gradually decreases over time and approaches a steady-state value, since the power of the exponential is negative. However, depending on applications, a diverging signal may be required. In this case, the power of the exponential is positive, and the signal gradually increases over time. In this paper, a clock generator is proposed whose frequency is increased exponentially over time. The proposed circuit can generate exponentially increasing voltage and clock signals with high accuracy over a wide operating range by using switched-capacitor (SC) technique. The generated voltage and the clock frequency are derived theoretically. Moreover, the design formulas for

	finding the circuit parameters with the initial value and the final value are also derived. The theoretical analysis of the proposed circuit are confirmed by experiments and SPICE simulations. From the experiments and the simulations, the clock frequency and the voltage are changed exponentially 1 kHz ~ 20 kHz and 0.4 V ~ 7.9 V, respectively. As an application, the Cockcroft-Walton circuit is driven by the proposed clock generator.
M3006 Session 3 Presentation 3 (16:15-16:30)	Design of a Short Range Optical Pulse Transceiver System for Intruder Detection Bokamoso Basutli, Adamu M. Zungeru, **Bokani Mtengi** and Bakary Diarra Botswana International University of Science and Technology, Botswana *Abstract*—Recent advancement in wireless technology enables free transmission between devices and automatic operation within the home areas. In this paper, we develop, design and implement an optical pulse transmitter and receiver systems to create the real ubiquitous communication link. To show the reality of the design, the optical pulse transceiver system is configured to allow detection of an intruder within a secured laboratory in Botswana International University of Science and Technology (BIUST) using a wireless link. In implementing the design, two sets of circuits, a transmitter circuit for transmitting information in the form of a signal from the source input and a receiver circuit for receiving the transmitted signal were designed. We achieved this by integrating analog component on two circuit boards. The system was simulated using Multisim, and simulation results were per the design specifications.
M3003 Session 3 Presentation 4 (16:30-16:45)	An Optimized Fractional Order Fuzzy And Fuzzy Controllers Based Mppt Using Pso for Photovoltaic Applications **Sharafadeen Muhammad** and Haruna Musa Jigawa State Polytechnic, Dutse – Nigeria Abstract—This paper presented comparison of an improved MPPT controller using particle swarm optimization (PSO) tuned fractional order fuzzy logic controller (FO-FLC) and conventional fuzzy logic controller MPPT for photovoltaic applications. The optimization was carried out in two steps: the first step computed optimal values of scaling factors and fractional operator while the second step optimize Controller output membership functions. Mean of Squared Error (MSE) is taking as objective function to be minimized using PSO. The optimal fractional operator shortens the tracking time and eliminate oscillations around MPP. The evaluation of the performance of the proposed controller and the simulations were carried out and the results shows that the FO-FLC provides better performance than conventional FLC in tracking of the PV maximum power.

M3017 Session 3 Presentation 5 (16:45-17:00)	Design and Implementation of Multi Agent Simulation Library MasCUDA for Parallel Processing with GPU Akira Ohiwa and **Hirohide Haga** Doshisha University, Japan *Abstract*—This paper presents the design and implementation of parallel processing support library, primary for multi-agent simulation with GPU (Graphical Processing Unit). GPU provides highly parallel processing environment. However, in order to develop software for GPU, high level skill and knowledge of GPU, parallel processing and GPU architecture are required, and these requirements sometimes disturb to use GPU for specific application development. In this article we will provide the library for GPU programming named MasCUDA. Users can develop their own application by their familiar language such as Ruby. GPU specific programming is hidden by MasCUDA and users need not to understand the detail of GPU programming. Our experimental evaluation proved that MasCUDA accelerates the execution speed more than 5,000 times faster than Ruby program and the number of source code with MasCUDA is approximately half of GPU specific language.
M2013 Session 3 Presentation 6 (17:00-17:15)	Wide-Band Transceiver for Ocean Acoustic Tomography in Coastal Waters **Kibae Lee**, Kang-Soo Heo, Jin-Seong Kang and Miheung Choe Kyungwon Industry Co., Ltd., Republic of Korea *Abstract*—Since the 1980's, many Coastal Acoustic Tomography Systems(CATS) have been designed with the traditional techniques, for monitoring the mesoscale fluctuation of temperature and current field in harbors, bays, straits, and inland seas. The techniques measure the sound speed and current field by using travel times of acoustic signals that are transmitted among the multiple acoustic stations. In order to obtain sufficient time accuracy by digital signal processing, wide band transceivers and their transducers are indispensable. This paper proposes the Wide band Coastal Acoustic Tomography System(WCATS) for precise measurement of the sound speed, which characterizes by the multiple band transducers and matching networking combining four different frequency bands. Also, the sound modulated by digital signal processing are transmitted and received through the wide band transducer. At this time, the time accuracy obtained after signal processing becomes better as the frequency bandwidth is wider. For the reason, we realize the system with the wideband of 2.5kHz~40kHz by combining four frequency band transducers and matching network. Finally, this paper experiences the developed WCATS in Jangheung in Korea, one of coastal areas.
M3007	An Enhanced Digital Stopwatch for Academic Purpose Samukannu Ravi, **Bokani Mtengi**, Adamu Murtala Zungeru and Joseph

Session 3 Presentation 7 (17:15-17:30)	Chuma Botswana International University of Science and Technology, Botswana *Abstract*—To address the problem of timing in our secondary schools, we present a design, simulation and implementation of an enhanced timing system for academic purposes. The system involves the design of a digital stopwatch for Ditsweletse Community Junior Secondary School in Botswana to be used in timing examinations and tests, laboratory experiments to enhance national and international competitiveness among students and promote scientific analysis for students. The system is divided into five major blocks that house different circuits and combined to perform the function of an enhanced digital stop watch. This division includes; Power supply, timing circuit, counter circuit, decoder, and display circuits. The system was designed and simulated using Proteus 8, a circuit building software used for building electronics system. The system was simulated, and simulation results were in accordance to the design specifications.

Session 4

Afternoon, September 26, 2019 (Thursday)
Time: 15:45-17:15
Venue: Seminar Room 3 (Lower Ground Floor)
Topic: "Communication and Information System"
Session Chair: Assoc. Prof. Arjuna Marzuki

M2006 Session 4 Presentation 1 (15:45-16:00)	Screening of Moderate Traumatic Brain Injury from Power Feature of Resting State Electroencephalography using Support Vector Machine **Chi Qin Lai**, Mohd Zaid Abdullah, Jafri Malin Abdullah, Azlinda Azman and Haidi Ibrahim Universiti Sains Malaysia, Malaysia *Abstract*—Traumatic brain injury (TBI) needs to be identified faster, so that suitable treatment can be planned properly. Normally, the severity of TBI is evaluated through the study from computed tomography (CT) or magnetic resonance imaging (MRI). Unfortunately, the number of CT scanners and MRI scanners is limited. Therefore, it is impractical to directly do CT or MRI scan to all patients without screening. Thus, this research investigates a method for screening moderate TBI patient. Data from resting state 63-channels electroencephalography is used in this work. Power of the signal is extracted from alpha, beta, theta and gamma frequency bands. This work utilizes a support vector machine, which is one of machine learning approaches, to identify moderate TBI patients. From the experimental results, it is shown that the average power from alpha or theta band gives the best accuracy score, which is at 70.83%.
M2012 Session 4 Presentation 2 (16:00-16:15)	Implementation of Abandoned, Lost and Discarded Fishing Gears(ALDFG) Monitoring System with Multiple Underwater Acoustic Transponders **Kibae Lee**, Jin-Seong Kang, Kang-Soo Heo and Miheung Choe Kyungwon Industry Co., Ltd., Republic of Korea *Abstract*—Abandoned, lost and discarded fishing gears(ALDFG) are polluting the marine environment, causing marine accidents and decreasing the catch of fish. In this paper, we propose the underwater communication system for monitoring fishing gears with multiple acoustic transponders. The system proposed is designed with special considerations in mind, including the implementation of communication

	techniques to minimize the power consumption of underwater transponders. The underwater communication is implemented using heterogeneous modulated signals for up-link and down-link. The acoustic transponder performs the modulation of CSS(chirp spread spectrum) with a low transmission power in up-link. And, the modulated signal of single frequency based on amplitude and time information is applied on the down-link in consideration of the advantage of power supply on the ship. This communication system is implemented with the functions of transponders using PZT(Piezoelectric) based acoustic sensor to provide UFI(User Friendly Interface). The implemented acoustic transponders are verified to be mountable on the fishing gears and to be operational for two months. Finally, this paper experiences the developed ALDFG monitoring system in Jeju island in Korea, one of fishing areas.
M2017 Session 4 Presentation 3 (16:15-16:30)	Review and Design of GPS-RFID Localization for Autonomous Vehicle Navigation **Muhammad Khosyi'in**, Sri Arttini Dwi Prasetyowati, Bhakti Yudho Suprapto and Zainuddin Nawawi Sultan Agung Islamic University, Indonesia *Abstract*—This paper discusses an alternative solution to the problem of autonomous vehicle navigation systems on the choice of technology in positioning the vehicle at a low cost but carries a high level of risk. The idea of using sonar and GPS in the navigation system can be an option, but the use of sonar is constrained by crosstalk problems between one sonar sensor and other sonar sensors. The use of Light Detection and Ranging (LIDARs) is also constrained by the high costs and stereo vision in LIDARs requiring powerful specific hardware to process camera information. Research studies on navigation systems using GPS-RFID based localization for visually impaired people become an inspiration for the idea of developing autonomous vehicle navigation using RFID-GPS fusion technology. The idea frame is to install RFID tags on the roadside that contain information on the location of routes to be taken by autonomous vehicles, reading RFID tags by Reader RFID with combined GPS module reading data will result in a more accurate location and is believed to be a reference for autonomous vehicle navigation systems. The initial results of several research studies on RFID testing for localization combined with GPS modules indicate that this idea is feasible.
M2011 Session 4 Presentation 4 (16:30-16:45)	Support Vector Machine Pre-Pruning Approaches on Decision Trees for Better Classification **Doreen Ying Ying Sim** Universiti Malaysia Sarawak, Malaysia Abstract—Incorporation of the structural risk minimization of Support Vector Machine to pre-prune the decision trees based on empirical risk

	minimization is conducted to develop a combined algorithm. It is named as Support Vector Machine Pruned Decision Trees (SVMPDT) algorithm. Pre-pruning of decision trees (DT) is applied to the datasets through the synergistically adjusted regularization parameter of SVM. This is done by the proposed new approach derived from the study on the synergy effects between the pre-pruning weighting fraction of DT and the regularization parameter of SVM. The regularization parameter of SVM is customized and adjusted based on the different features and characteristics of DT from each applied dataset. After applying the proposed algorithms to the assigned datasets, it is shown to be more accurate in classification when compared with typical SVM without getting its parameter adjusted accordingly and the typical DT classification without applying pre-pruned weighting fraction as well as the default SVMDT algorithms without getting the DT to be pre-pruned. This is because its regularization parameter of SVM can be optimally adjusted with the newly proposed formulations on the pre-pruned weighting fraction of DT in a synergy way such that the classification accuracies can significantly be improved.
M2018 Session 4 Presentation 5 (16:45-17:00)	A Study of Leakage Inspection System for EWP **Namhyun Yoo** Kyungnam University, Republic of Korea *Abstract*—An EWP (Electric Water Pump) is one of the most important devices for circulation of refrigerant used in automotive cooling system. Prior to using the EWP, a passive circulating motor connected to an automobile engine was used. Existing motors are being replaced by EWPs due to problems such as degraded engine efficiency. In this paper, we propose a real – time leakage inspection system connected with a robotic system that mass – produces EWPs. The leakage inspection system judges whether there is a defect by inspecting the EWP manufactured through the production system in real time. For efficient detection, various media such as air, water, and helium were used. Among them, helium is the best way to detect defect of a manufactured EWP. In the case of using the leakage inspection system proposed in this paper, it is possible to shorten the entire manufacturing process and reduce the cost by judging whether there is a defect in EWP in real time.
M2020 Session 4 Presentation 6 (17:00-17:15)	The Four Patches of Triangular Microstrip Antennas as Configuration of CP-SAR **Muhammad Fauzan Edy Purnomo**, Vita Kusumasari, Hadi Suyono, Rini Nur Hasanah and Akio Kitagawa Brawijaya University, Indonesia *Abstract*—In this paper, we design triangular microstrip antennas both Left Handed Circularly Polarized (LHCP) and Right Handed Circularly Polarized (RHCP) as the configuration of Circularly Polarized-Synthetic Aperture Radar (CP-SAR) operated and embedded at the L-band on

airspace having a compact size, lightweight, conformability of the substrate surface, low cost, easier to integrate with other circuits, and flexible. The investigation of triangular microstrip antennas and its radiation characteristics are performed by numerical simulations aimed at CP-SAR sensor application. The corporate feeding-line design is implemented by combining some T-junctions to distribute the current from input port to radiating patches and to reach four patches of LHCP and RHCP antennas. The performances of triangular microstrip antennas satisfy the requirement of the specification of CP-SAR system using airspace.

Poster Session

Afternoon, September 26, 2019 (Thursday)
Time: 13:30-17:00
Venue: Seminar Room 3 (Lower Ground Floor)

M3019 Poster 1	Hardware System Performance Enhancement Method in the Design Stage for Automotive Engine Mount Control Module **JeongHyun Cho** and Ryu HyunKi Yeungnam University College, Republic of Korea *Abstract*—Currently, automaker companies are applying mechanical / electronic technologies to various automotive parts for decreasing vehicle vibration. One of the best ways to reduce engine vibration is to apply an active engine control mount(ACM). This paper's main issue is to decrease design errors by signal malfunction and electromagnetic compatibility(EMC) in the design phase of ACM electronic control module development. To do this process, we analyzed the power integrity(PI) analysis which is one of Computer Aided Engineering(CAE) methods. Also, we introduce several ways to secure SI and PI using various methods. So, by applying the analysis results to the design stage, we improved the electromagnetic wave performance. Also, we can reduce the PCB design cost, and improved the reliability of the electromagnetic wave.
M3014 Poster 2	Research on Isolated Grid Connected Series Resonant Inverter **Imad Hussain**, Muhammad Mansoor Khan, Yaqoob Ali, Abdar Ali, Danish khan and Asad khan Shanghai Jiao Tong University, China *Abstract*—Galvanic isolation and power quality improvement are significant requirements in Grid Connected Micro-Inverters (GCMI). The efficiency, size and cost are the major concerns in isolated Grid Connected Inverters (GCI). This paper presents a novel single stage Isolated Grid Connected-Series Resonant Inverter (IGC-SRI) topology, employed for medium power applications. The size and cost of the proposed scheme is minimized by implementing fewer components. A soft switching technique through LC tank is employed which ultimately increase the overall efficiency of the system. Furthermore, a new resettable integrated based sampling control strategy is investigated to ensure soft switching. For a wide range of voltage gain, all switches operate under either Zero-Current-Switching (ZCS) turn-on or Zero-Voltage-Switching (ZVS) turn-off conditions. The proposed topology is simulated in MATLAB/Simulink environment.

M3008 Poster 3	Feedback Gain Design of Adaptive Luenberger Observer on PMSM Sensorless Control **Guangpu Chen**, W. Yao and W. Zhang Zhejiang University, China *Abstract*—The sensorless control technology for permanent magnet synchronous motor is now one of the research hotspots of many scholars at home and abroad. The key to the sensorless control technology using field-oriented ontrol method is the acquisition of motor speed and rotor position. As a common method of speed estimation, Luenberger observer has the advantages of fast response speed, high estimation accuracy and good stability. However, the selection of feedback gain will affect the speed estimation effect to a large extent. For the problem that how to quickly and effectively select the feedback gain in sensorless control of PMSM based on Luenberger observer, a fourth-order adaptive observer that changes the feedback gain according to the motor speed by analyzing the mathematical model of PMSM in two phase static frame and using the idea of pole placement was proposed. Simulation and experimental results show that the feedback gain selection method is reasonable and effective, the designed adaptive Luenberger observer has good estimation accuracy, fast dynamic response and strong versatility for motors with different parameters, and greatly simplifies parameter tuning process.
M3009 Poster 4	Simulation Research on Electric Field Distribution of 10KV Vacuum Circuit Breaker Based on ANSYS **Liu Ying**, Weili Wu and Li Feng Xi'an University of Science and Technology, China *Abstract*—Taking the 10kV vacuum circuit breaker as an example, the ANSYS simulation software is used to simulate the electric field distribution in the vacuum interrupter. It is found that the different opening distances between the contacts have a direct influence on the distribution and size of the electric field. When the distance between the contacts is extremely small, it is easy to cause a gap breakdown between the contacts. Therefore, we compare the electric field results obtained under different opening distances, keep the contact spacing within a reasonable range, prevent the breakdown phenomenon, and reasonably improve the design of the circuit breaker and increase the service life of the vacuum bubble.
M0005 Poster 5	The Role of Complement in the Treatment of Tumor Diseases I. A. Franceva, **J. K. Ukibayev**, U. M. Datkhayev, A. P. Francev, T. G. Goncharova, V. K. Krasnoshtanov and D. A. Myrzakozha Kazakh National Medical University named after S.D. Asfendiyarov, Kazakhstan *Abstract*—The phenomenon of antibody - is dependent on the cell in

which occurs the main mechanism of action of all targeted antitumor preparations containing monoclonal or polyclonal antibodies. Successful manifestation of this phenomenon is possible only with the correct ratio between the antigens of cancer cells, antibodies specific to them and the required amount of complement. The following paper shows the need to monitor the quantitative content of complement in the patient's serum and correct its content by introducing the required volume of fresh frozen plasma as a source of exogenous complement. The required amount of specific antibodies (dosage of the drug) must be determined after proper correction of the amount of complement in the patient's blood. If this condition is met, the maximum efficacy of the drug and the increased success of the treatment of tumor diseases will be achieved.

M0013 Poster 6	ActiView: A MATLAB-Based Toolbox for Realtime Cortical Activation Analysis using Functional Near-infrared Spectroscopy **Gihyoun Lee**, Ji-su Park, Jun-Yong Hong and Young-Jin Jung Samsung Medical Center, Dongseo Unversity, Republic of Korea *Abstract*—Brain cortical activation analysis is important for understanding the causes of neurological disorders and relevant brain mechanisms. Over the past decades, various studies have been published on the brain functional activities and cortical activation analysis using functional near-infrared spectroscopy (fNIRS). The fNIRS yields outputs similar to the blood-oxygen-level-dependent (BOLD) signals of the functional magnetic resonance imaging (fMRI) and has an advantage that can measure higher temporal resolution than fMRI. In this paper, we developed a MATLAB toolbox, referred to as ActiView, for analyzing the cortical activation on realtime. Although the existence of numerous analysis toolboxes for fNIRS, most of these are not easy to use because they involve numerous steps, coefficients, anatomic information, 3-dimensions coordinator, and related files. Given that ActiView consists of a simple and intuitive graphical user interface (GUI), users can lightly analyze the brain cortical activation by using fNIRS signals. To investigate the developed toolbox, the hand clenching task experiment—extensively used in brain functional activity studies—was applied. The experimental results elicited the realtime brain cortical activation results compare to the offline brain cortical activity that was analyzed using NIRS SPM—one of the most extensively used NIRS analysis toolboxes.
M0007 Poster 7	An Automated Metabolic Network Reconstruction of *Elaeis Guineensis* **Ishak N.A.**, Aplop F., Hassan, H., Tahir N. I and Ramli U. S. Malaysian Palm Oil Board (MPOB), Malaysia *Abstract*—Metabolic network reconstruction is an approach of how researcher could investigate the interaction of a specific organism's small molecules in a form of network to unveil important biochemical

	information. Using automated bioinformatics tools, a quantitative model can be generated to simulate whole cellular behaviour and a model organism database can be developed quickly in a genome-scale context. The reconstructed model can be used to facilitate a variety of analysis and simulation techniques that can enrich the understanding of cellular system and delineate biological functions, which are very important in bioprocessing and biotechnology applications. In this study, we reconstructed a metabolic model for *Elaeis guineensis*, a high-yielding source of vegetable oil, which is utilized in many food and non-food products. Its genome was obtained from NCBI and PathoLogic of Pathway Tools Softwares (Ptools) was used to develop its draft reconstruction, where it creates a Pathway/Genome Database (PGDB) containing the predicted biological entities. The results showed that 205 biochemical pathways were predicted for *Elaeis guineensis*, which comprised of 23183 genes, 19888 proteins, 1300 compounds, 1526 enzymatic reactions and 16 transport reactions.
M1005 Poster 8	Integrated Consensus Genetic Map and Genomic Scaffolds Re-Ordering of Oil Palm (E. guineensis) Genome **Nik Shazana Nik M. Sanusi**, Rozana Rosli, Chan Kuang Lim, Mohd Amin Ab Halim and Leslie Low Eng Ti Malaysian Palm Oil Board (MPOB), Malaysia *Abstract*—A high-quality reference genome is an important resource to study the genetic basis of traits through linkage or association analyses. Presently, the publicly available oil palm draft genome sequence of AVROS pisifera (EG5) accounts for 1.535Gb of the 1.8Gb oil palm genome. However, the assemblies are fragmented and only 43% of the sequence were placed in pseudochromosomes. By integrating multiple sets of SNP and SSR-based genetic maps, a consensus map (AM_EG5.1) with a total of 830.21Mb genomic scaffolds anchored into 16 pseudochromosomes was constructed. This accounted for 54% of the genome assembly, which was a great improvement to the original genome sequence. The total length of N50 scaffolds anchored in pseudo-chromosomes has increased by~18% compared to the previous assembly. To further evaluate the assembly, 118 genomic libraries of pisifera were read-mapped to the AM_EG5 in comparison with EG5. Of the 98.32% sequences mapped, a greater number of properly-paired sequence reads mapped back to the AM_EG5 (62.71%) as compared to EG5 (52.04%), indicating a greater coverage of the original sequence data in the new assembly. This improved chromosomal-level genome will provide a valuable resource for genetic research in oil palm.

Dinner	
18:00-20:00	**Lower Ground Floor**

Conference Venue

Sains@USM, Block C, Universiti Sains Malaysia, Penang, Malaysia
http://www.usainsgroup.com/services-education.php
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Note

Note

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