

2017 SINGAPORE CONFERENCE ABSTRACT

June 22-24, 2017

**National University of Singapore, Shaw Foundation
Alumni House, Singapore**



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2017 Singapore Conference Introduction

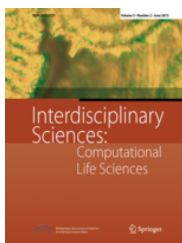
Welcome to 2017 Singapore conference. The objective of the Singapore conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Bioinformatics and Biomedical Science, Biometric and Forensic Engineering.

2017 6th International Conference on Bioinformatics and Biomedical Science (ICBBS 2017)

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



International Conference Proceedings Series by ACM. Archived in the ACM Digital Library, and indexed by Ei Compendex and submitted to be reviewed by Scopus and Thomson Reuters Conference Proceedings Citation Index (ISI Web of Science).



Journal-Interdisciplinary Sciences: Computational Life Sciences (ISSN: 1913-2751 (print version); ISSN: 1867-1462 (electronic version)) Indexed by Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, PubMed/Medline, SCOPUS, EMBASE and so on.

Conference website and email: <http://www.icbbs.org/>; icbbs@cbees.org

2017 International Conference on Biometrics and Forensic Engineering (ICBFE 2017)

Papers will be published in the following conference proceedings or journal:



International Conference Proceedings Series by ACM. Archived in the ACM Digital Library, and indexed by Ei Compendex and submitted to be reviewed by Scopus and Thomson Reuters Conference Proceedings Citation Index (ISI Web of Science).



International Journal of Bioscience, Biochemistry and Bioinformatics (IJBBB, ISSN: 2010-3638). Included in the Engineering & Technology Digital Library, and indexed by WorldCat, Google Scholar, Cross ref, ProQuest.

Conference website and email: <http://www.icbfe.org/>; icbfe@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 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 **12** Minutes of Presentation and **3** Minutes of Question and Answer

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

Plenary Speech: about **25** Minutes of Presentation and **5** 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

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 each session on June 22-23, 2017.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introductions

Keynote Speaker I



Prof. Patrick Wang

Northeastern University, USA

Prof. Patrick S.P. Wang, PhD. Fellow, IAPR, ISIBM, WASE and IEEE and ISIBM Outstanding Achievement Awardee, and is Tenured Full Professor, Northeastern University, USA, iCORE (Informatics Circle of Research Excellence) Visiting Professor, University of Calgary, Canada, Otto-Von-Guericke Distinguished Guest Professor, Magdeburg University, Germany, Zijiang Visiting Chair, ECNU, Shanghai, China, as well as honorary advisory professor of several key universities in China, including Sichuan University, Xiamen University, East China Normal University, Shanghai, and Guangxi Normal University, Guilin. Prof. Wang received his BSEE from National Chiao Tung University (Jiaotong University), MSEE from National Taiwan University, MSICS from Georgia Institute of Technology, and PhD, Computer Science from Oregon State University. Dr. Wang has published over 26 books, 200 technical papers, 3 USA/European Patents, in PR/AI/TV/Cybernetics/Imaging, and is currently founding Editor-in-Chief of IJPRAI (International Journal of Pattern Recognition and Artificial Intelligence) , and Book Series of MPAI, WSP. In addition to his technical interests, Dr. Wang also published a prose book, “Harvard Meditation Melody” 《哈佛冥想曲》and many articles and poems regarding Du Fu and Li Bai’ s poems, Beethoven, Brahms, Mozart and Tchaikovsky’s symphonies, and Bizet, Verdi, Puccini and Rossini’s operas.

Topic: “*Intelligent Forensics, Big Data and Applications--- Security, Safer Transportation and Greener World in Interactive Learning Environment*”

Abstract—This talk is concerned with fundamental aspects of Intelligent Pattern Recognition (IPR) and applications. It basically includes the following: Basic Concept of Automata, Grammars, Trees, Graphs and Languages. Ambiguity and its Importance, Brief Overview of Artificial Intelligence (AI), Brief Overview of Pattern Recognition (PR), What is Intelligent Pattern Recognition (IPR)? Interactive Pattern Recognition Concept, Importance of Measurement and Ambiguity, How it works, Modeling and Simulation, Basic Principles and Applications to Computer Vision, Security, Road Sign Design, Safer Traffic and Robot Driving with Vision, Ambiguous Dangerous and Bad) design of Road Signs vs Unambiguous (Good) Road Signs, How to Disambiguate an Ambiguous Road Sign? What is Big Data? And more Examples and Applications of Learning and Greener World using Computer Vision. Finally, some future research directions are discussed.

Keynote Speaker II



Prof. David Zhang

The Hong Kong Polytechnic University, Hong Kong

Prof. David Zhang graduated in Computer Science from Peking University. He received his MSc in 1982 and his PhD in 1985 in Computer Science from the Harbin Institute of Technology (HIT), respectively. From 1986 to 1988 he was a Postdoctoral Fellow at Tsinghua University and then an Associate Professor at the Academia Sinica, Beijing. In 1994 he received his second PhD in Electrical and Computer Engineering from the University of Waterloo, Ontario, Canada. He is a Chair Professor since 2005 at the Hong Kong Polytechnic University where he is the Founding Director of the Biometrics Research Centre (UGC/CRC) supported by the Hong Kong SAR Government in 1998. He also serves as Visiting Chair Professor in Tsinghua University, and Adjunct Professor in Peking University, Shanghai Jiao Tong University, HIT, and the University of Waterloo. He is Founder and Editor-in-Chief, International Journal of Image and Graphics (IJIG); Founder and Series Editor, Springer International Series on Biometrics (KISB); Organizer, the 1st International Conference on Biometrics Authentication (ICBA); Associate Editor of more than ten international journals including IEEE Transactions and so on. So far, he has published over 20 monographs, 400 international journal papers and 40 patents from USA/Japan/HK/China. According to Google Scholar, his papers have got over 42,000 citations and H-index is 93. He was listed as a Highly Cited Researcher in Engineering by Thomson Reuters in 2014, 2015 and 2016, respectively. Professor Zhang is a Croucher Senior Research Fellow, Distinguished Speaker of the IEEE Computer Society, and a Fellow of both IEEE and IAPR.

Topic: “*Hand-Based Biometrics*”

Abstract—Automatic personal authentication using biometric information is becoming more essential in applications of public security, access control, forensics, banking, etc. Many kinds of biometric authentication techniques have been developed based on different biometric characteristics. This presentation will introduce our research related to hand-based biometrics, including palmprint/fingerprint/knuckle/vein recognition. In particular, hand-based 3D biometrics and multispectral biometrics are presented, which has led to the extensive study of biometric technologies and the development of numerous algorithms, applications, and systems. Some useful achievements could be given to illustrate their effectiveness.

Plenary Speaker I



Prof. Dong-Qing Wei
Shanghai Jiaotong University, China

Prof. Dong-Qing Wei is a professor of bioinformatics in the Department of Bioinformatics and Biostatistics, College of Life Science and Biotechnology, Shanghai Jiaotong University and editor-in-Chief of Interdisciplinary Sciences- Computational Life Sciences. Prof. Wei's research is in the general field of bioinformatics with more than 250 journal papers, 9 monographs with 5000 SCI citations and an H factor of 45. Prof. Wei is best known for contributions to the development of molecular simulation tools and statistical models with applications to a wide range of chemical, physical and biological systems, from electrolytes, to polar liquids, to ferroelectric liquid crystals, to combined Quantum Mechanical/Molecular Mechanical (QM/MM) systems, to membrane proteins and protein-ligand and protein-protein complexes applied to computer aided drug design.

Topic: *“Personalized Drug in the Era of Big Data and Precision Medicine”*

Abstract—The cytochrome P450 (CYP450) superfamily acts as an important role responsible for the oxidation of almost 90% currently used drugs. As variations of Single Nucleotide Polymorphism (SNPs) in human CYP450 genes will cause different drug effects and even adverse effects, studies on SNPs of human CYP450 genes can be used for indicating the most possible genes associated with human diseases and relevant therapeutic targets, predicting the drug efficacy and adverse drug response, investigating individual gene specific properties and then providing personalized and optimal clinic therapies. We have made extensive bioinformatics studies of CYP450 SNPs and its impact on the drug metabolism in the frame work of personalized medicine, i.e., SNPs prediction, the substrate specificity, comparative molecular field analysis, molecular dynamics simulation and QM/MM studies of the metabolic mechanism. Based on structure of membrane protein targets acquired by bioinformatics tools, and database of molecules extracted from the Traditional Chinese medicines, various cheminformatics procedures, in the context of network pharmacology, were performed to screen for potential active compounds. A molecule was obtained, named wgx-50 which is an effective component from the Sichuan pepper. Extensive experiments strongly suggest that wgx-50 possess biologic functions against AD. Discoveries were also made in its potential role in anti-aging.

Plenary Speaker II



Associate Prof. Gautam Sethi
National University of Singapore, Clinical Research Centre, Singapore

EDUCATION/TRAINING

B. S. 1998 Banaras Hindu University, Varanasi, India Chemistry (Honours)

M. S. 2000 Banaras Hindu University, Varanasi, India Biochemistry

Ph.D 2004 Banaras Hindu University, Varanasi, India Biotechnology

PDF 2004-07 UTMDACC Houston, Texas, USA. Cancer biology.

Asst Prof. 2008-14 National University of Singapore Pharmacology

Associate Prof. 2014- Now National University of Singapore

POSITIONS AND EMPLOYMENT

Sept. 2000 to Aug. 2002 Junior Research Fellow, School of Biotechnology, Banaras Hindu University, Varanasi, India.

Sept. 2002 to March 2004 Senior Research Fellow, School of Biotechnology, Banaras Hindu University, Varanasi, India

2004-2007 Postdoctoral Fellow, The University of Texas MD Anderson Cancer Center.

2008-2014 Assistant Professor, Dept. of Pharmacology, NUS.

2014-Now Associate Professor with tenure, Dept. of Pharmacology, NUS

Topic: “*Role of Nimbolide in Prostate Cancer Therapy*”

Abstract—STATs comprise a family of cytoplasmic transcription factors that transmit signals, mediate intracellular signaling usually generated at cell surface receptors and transmitted to the nucleus. Numerous studies have demonstrated constitutive activation of STAT3 in a wide variety of human tumors, including blood malignancies (leukemias, lymphomas, and multiple myeloma) as well as solid tissues (such as head and neck, breast, lung, gastric, hepatocellular and prostate cancers). There is a strong evidence to suggest that aberrant STAT3 signaling promotes development and progression of prostate cancer by either inhibiting apoptosis or inducing cell proliferation, angiogenesis, invasion, and metastasis. However, the development of novel drugs for the targeting STAT3 that is both safe and efficacious remains an important scientific and clinical challenge. We will present the data that shows that novel small molecule inhibitors of STAT3/JAK2 pathway can suppress the expression of genes involved in prostate cancer initiation, and promotion both *in vitro* and *in vivo*.

Plenary Speaker III



Assoc. Prof. Kwoh Chee Keong
Nanyang Technological University, Singapore

Dr. Kwoh Chee Keong is in the School of Computer Science and Engineering, Nanyang Technological University. His is the Assistant Chair of Graduate Studies and the Programme Director, MSc (Bioinformatics). He was the Deputy Director, Biomedical Engrg Research Centre, NTU, and Deputy Director, Biomedical & Pharmaceutical Engineering Cluster (BPE) Cluster and had a joint appointment in the School of Chemical and Biomedical Engineering. He received his Bachelor degree in Electrical Engineering (1st Class) and Master in Industrial System Engineering from the National University of Singapore in 1987 and 1991 respectively. He received his Ph.D. degrees from the Imperial College of Science, Technology and Medicine, University of London in 1995. His research interests include Data Analytics and Mining, Soft Computing and Graph-Based inference; applications areas include Bioinformatics, Health informatics and Biomedical Engineering. He has done significant research work his research areas and published many quality international conferences and journal papers. His is in the Editorial Board Members and Associate Editor for of The International Journal of Data Mining and Bioinformatics; IEEE Access; The Scientific World JOURNAL; Network Modeling and Analysis in Health Informatics and Bioinformatics (NetMAHIB); Theoretical Biology Insights; and Bioinformation. He has been Guest Editor for many journals such as JMMB; International Journal on Biomedical and Pharmaceutical Engineering and others. He has been often invited as an organizing member or referee and reviewer for a number of premier conferences and journals, including GIW, IEEE BIBM, RECOMB, PRIB, BIBM, ICDM, and iCBBE just to name a few. Dr. Kwoh is a member of The Institution of Engineers Singapore, Association for Medical and Bio-Informatics, Imperial College Alumni Association of Singapore (ICAAS). He has provided many service to professional bodies, various appointments from Ministry of Social and Family; Ministry of Law; and Ministry of Transport in Singapore and was conferred the Public Service Medal by the President of Singapore in 2008.

Topic: “*Analyzing the Virulency of Influenza Viruses: Challenges and Solutions*”

Abstract—Influenza has been a major and persistent threat for public health for centuries, causing deaths and huge economic loss worldwide every year. Among the three types denoted as A, B and C, influenza A viruses are the most virulent due to their high mutation rate, frequent genetic reassortment and short generation time, which have caused several pandemics in recent history. The human influenza viruses undergo rapid evolution (especially in hemagglutinin (HA), a glycoprotein on the surface of the virus, which enable the virus population constantly evade the human immune system. This talk, by presenting selected research activities, will provide an overview of some technologies and approaches, such as characterize the evolution of influenza viruses for better selection of vaccine candidates and the prediction of pandemic strains; studies focused on the antigenic evolution analysis, aiming for characterizing the evolutionary path of influenza viruses and predicting the next generation of dominant strains; to address the challenges and solutions on both in the micro- and macro-scale study.

Invited Speaker



Dr. Xi Xie
Sun Yat-Sen University, China

Dr. Xi Xie got his Ph.D degree in 2014 at Stanford University in Prof. Nick Melosh's lab, and got postdoctoral training at Massachusetts Institute of Technology in Prof. Robert Langer and Prof. Dan Anderson's lab from 2014-2016. In 2016, he was awarded with National Thousand Youth Talents Plan (China), and has been working as Professor in School of Electronic and Information Technology at Sun Yat-Sen University, and as adjunct professor in The First Affiliated Hospital of Sun Yat-Sen University. Dr. Xie's lab has been working on nanodevices and nanomaterials for biomedical application, flexible electronics and bioelectronics, wearable electronics, and biomedical engineering. He has published many papers on high impact journals such as ACS Nano and Nano Letters as first author or corresponding author.

Topic: "*Nanoneedle Cell Penetration for Intracellular Drug Delivery*"

Abstract—Introduction of biomolecules across the cell membrane with high efficiency is a challenging yet critical technique in biomedicine. Vertically nanoneedle arrays have been recently reported to offer new opportunities to access a cells' interior by directly breaching the cell membrane, yet microscopic understanding of how and when the nanowires penetrate cell membranes is still lacking. First, to elucidate the possible penetration mechanisms, a continuum elastic cell mechanics model is presented to address how penetration occurs, and explore the characteristics that affect penetration. Our results reveal that cell penetration is likely to occur only for a limited time window during cell adhesion. The penetration effects of nanoneedle geometry and cell properties are systematically evaluated. Nanoneedle cell penetration efficiency is low, and were unable to achieve efficient DNA plasmid transfection. A nanoneedle-electroporation platform was developed to achieve highly efficient molecular delivery and high transfection yields with excellent uniformity and cell viability. Cellular engulfment of the nanoneedles provides an intimate contact, significantly reducing the necessary electroporation voltage and increasing homogeneity over a large area. Biomolecule delivery is achieved by diffusion through the nanoneedles and enhanced by electrophoresis during pulsing. The system was demonstrated to offer excellent spatial, temporal, and dose control for delivery, as well as providing high-yield co-transfection and sequential transfection.

Brief Schedule for Conference

Day 1	June 22, 2017 (Thursday)	
	Venue: Thyme (Level 2)	
	Arrival Registration	10:00~16:00
	Afternoon Conference	
	Venue: Thyme (Level 2)	
Day 2	Keynote Speech and Conference Presentation	
	Opening Remarks	13:30~13:35
	Keynote Speech I	13:35~14:10
	Session 1: 14:10~15:55	
	Venue: Thyme (Level 2)	
	7 presentations-Topic: "Biometrics and Image Processing"	
	Group Photo & Academic Visit	15:55~18:00
	June 23, 2017 (Friday)	
	Venue: Lemongrass (Level 2)	
	Keynote Speech, Plenary Speech and Conference Presentation	
	Morning Conference	
	Venue: Lemongrass (Level 2)	
	Opening Remarks	8:30~8:35
Keynote Speech II	8:35~9:10	
Plenary Speech I	9:10~9:40	
Group Photo & Coffee Break	9:40~10:10	
Plenary Speech II	10:10~10:40	
Day 2	Session 2: 10:40~12:10	
	Venue: Lemongrass (Level 2)	
	6 presentations-Topic: "Basic Medicine and Biomedical Engineering"	
	Lunch 12:10~13:20	Venue: Before Clove Room (Level 2)
	Afternoon Conference	
	Plenary Speech III	13:20~13:50
	Session 3: 13:50~16:05	
	Venue: Lemongrass (Level 2)	
	9 presentations-Topic: "Bioinformatics and Computational Biology"	
	Coffee Break 16:05~16:30	
	Session 4: 16:30~18:00	
Venue: Lemongrass (Level 2)		
6 presentations-Topic: "Basic Medicine and Biomedical Engineering"		
Poster session 8:30~18:00	Venue: Lemongrass (Level 2)	
Dinner 18:00	Venue: The University Club	
Day 3	9:00-17:00 June 24, 2017 (Saturday)	
	One Day Tour	

Tips: Please arrive at the Conference Room 10 minutes before the session begins to upload PPT into the laptop.

Detailed Schedule for Conference

June 22, 2017 (Thursday)

Venue: Thyme (Level 2)

10:00~16:00	Arrival and Registration	
13:30~13:35		<p>Opening Remarks Assoc. Prof. Gautam Sethi National University of Singapore, Clinical Research Centre, Singapore</p>
13:35~14:10		<p>Keynote Speech I Prof. Patrick Wang Northeastern University, USA Topic: <i>“Intelligent Forensics, Big Data and Applications--- Security, Safer Transportation and Greener World in Interactive Learning Environment”</i></p>
14:10~15:55	<p>Session 1 Venue: Thyme (Level 2)</p>	
15:55~18:00	<p>Group Photo & Academic Vist (Centre for Translational Medicine, NUS- Department of Pharmacology, NUS- Central Library/Tour of NUS Campus by Free Internal Shuttle Bus)</p>	

Note: (1) The registration can also be done at any time during the conference.

(2) The organizer doesn't provide accommodation, and we suggest you make an early reservation.

(3) One Best Oral Presentation will be selected from each oral presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of each session on June 22-23, 2017.

Let's move to the session!

Session 1

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, June 22, 2017 (Thursday)

Time: 14:10~15:55

Venue: Thyme (Level 2)

Session 1: 7 presentations- Topic: “Biometrics and Image Processing”

Session Chair: Assoc. Prof. Gautam Sethi

S0005 Presentation 1 (14:10~14:25)

Audio-Visual Biometric Authentication for Secured Access into Personal Devices

Q. Memon, Z. AlKassim, E. AlHassan, M. Omer, and M. Alsiddig

UAE University, UAE

Abstract—The security of data is becoming a challenge, as newer smarter devices with increasingly more memory are appearing in the market. Currently, most of the user data remains on personal devices, when the user is either mobile or at workplace. The username and password are turning out to be old-fashioned techniques for secured access. In this work, a multimodal biometric authentication technique is proposed to boost access security of such devices. Face recognition, speaker identification along with uttered word are fused together to determine authentication score before access to devices is granted. Experimental results show that as the number of biometric modes is increased, greater trust and satisfaction is experienced by the user.

Afternoon, June 22, 2017 (Thursday)

Time: 14:10~15:55

Venue: Thyme (Level 2)

Session 1: 7 presentations- Topic: “Biometrics and Image Processing”

Session Chair: Assoc. Prof. Gautam Sethi

S0011 Presentation 2 (14:25~14:40)

Acne Detection Using Speeded up Robust Features and Quantification Using K-Nearest Neighbors Algorithm

Natchapol Kittigul and Bunyarit Uyyanonvara

Thammasat University, Thailand

Abstract—About 85% of people between the age of 12 and 24 experience acne, the acne treatment cost exceed \$3 billion in U.S.A. Currently dermatologist use manual skin assessment method such as visual and photography then manually mark and count acne on patient face which is time consuming and subjective. This paper proposed acne detection method using Speeded Up Robust Features then classified using 5 designed features: Hue Mean, Standard Deviation (SD) of Red, SD of Green, SD of Blue and Circularity. Quantification using K-Nearest Neighbors algorithm (KNN) was also assessed. The result presented 68% accuracy with 73% sensitivity and 84% precision on average.

Afternoon, June 22, 2017 (Thursday)

Time: 14:10~15:55

Venue: Thyme (Level 2)

Session 1: 7 presentations- Topic: “Biometrics and Image Processing”

Session Chair: Assoc. Prof. Gautam Sethi

F0003 Presentation 3 (14:40~14:55)

Generation of Cancelable Iris Template Using Bi-level Transformation

P. Punithavathi, **S. Geetha**, and S. Sasikala

School of Computing Science and Engineering, VIT University Chennai Campus, India

Abstract—Cancelable biometric system is a transformation technique for securing biometric templates. This work proposes application of bi-level template securing technique at feature-level, and generates revocable templates. The bi-level transformation includes Discrete Fourier Transform and partial Hadamard based transformations on iris features, using user-specific key. The proposed bi-level transformation applied at feature-level provides better robustness and security against correlation attacks. A comprehensive analysis has been performed on the proposed approach to study the non-invertibility, diversity, revocability and matching performance on iris samples. The experimental results show that the proposed approach is promising, and deliver good performance.

Afternoon, June 22, 2017 (Thursday)

Time: 14:10~15:55

Venue: Thyme (Level 2)

Session 1: 7 presentations- Topic: “Biometrics and Image Processing”

Session Chair: Assoc. Prof. Gautam Sethi

S0001 Presentation 4 (14:55~15:10)

MicroRNA-Regulated Network Motifs with Drug Association in Lung Cancer

Nilubon Kurubanjerdjit and Ka-Lok Ng

Mea Fah Luang University, Thailand

Abstract—The value of microRNAs as therapeutic targets is now widely recognized. The regulation of microRNAs has an important role in cancer progression, and increasing importance of microRNA is the use of microRNA signatures in the diagnosis, prognosis and also drug treatment of many kinds of cancer such as lung cancer, breast cancer, and colon cancer. This study aim to understand the role of microRNA associated in cancer therapies and drug discovery, we identified microRNAs and their down-stream protein-protein interaction motifs for lung cancer based on a network topology analysis approach which is Clique Percolation Clustering Method (CPM). Then, target drugs of each significant motif were investigated by drug-gene interaction databases. It is expected that this study may insight explore the role of microRNA in cancer therapy and associated with drug response.

Ground and Floor Topography Detection for the Blind.

Afternoon, June 22, 2017 (Thursday)

Time: 14:10~15:55

Venue: Thyme (Level 2)

Session 1: 7 presentations- Topic: “Biometrics and Image Processing”

Session Chair: Assoc. Prof. Gautam Sethi

S0022 Presentation 5 (15:10~15:25)

Comparative Study of Segmentation Techniques for Detection of Tumors Based on MRI Brain Images

Ashraf M. Said and Fatma Sayed Ibrahim

Minia University, Cairo, Egypt

Abstract—The aim of this paper is to propose a matlab toolbox of a comparative study of four brain tumor segmentation methods with specific sequences. Four methods are K-means clustering, fuzzy C-means clustering, Region growing, and Otsu segmentation. Skull stripping algorithm has done before segmentation. Different preprocessing algorithms are applied before segmentation to enhance images and give better segmentation. Median filter, Gaussian filter, and contrast enhancement are applied according to segmentation method. The database used is based on DICOM images. GLCM used for feature extraction. Classification and accuracy measurement are done by ANN.

Afternoon, June 22, 2017 (Thursday)

Time: 14:10~15:55

Venue: Thyme (Level 2)

Session 1: 7 presentations- Topic: “Biometrics and Image Processing”

Session Chair: Assoc. Prof. Gautam Sethi

S0034 Presentation 6 (15:25~15:40)

Support Vector Machines and Variability of Spatio- Temporal Gait Parameters for Recognition of Parkinsonian Gait

Monica Azqueta-Gavaldon, Andres Azqueta, **Inigo Azqueta-Gavaldon**, and Eduard Kraft

Robotics and Embedded Systems, Technical University Munich, Germany

Abstract—Pathological gait in Parkinson disease is characterized by a shortening of the steps length, an increase of the step frequency and an increase of double support time. Treadmills equipped with pressure sensors provide a full overview of spatio-temporal gait parameters. These are used to quantify gait deterioration or the efficacy of gait rehabilitation therapies. Nevertheless, the gait pattern on a treadmill differs from the natural one, especially in pathological patients with unsecure gait. Even healthy subjects show a shortening of the steps length and an unnatural gait. In such case, the standard spatio-temporal parameters generally used do not provide reliable information to assess the gait performance.

Afternoon, June 22, 2017 (Thursday)

Time: 14:10~15:55

Venue: Thyme (Level 2)

Session 1: 7 presentations- Topic: “Biometrics and Image Processing”

Session Chair: Assoc. Prof. Gautam Sethi

S0043 Presentation 7 (15:40~15:55)

Accurate Vessel Segmentation for ICCI Computation

Chia-Yi Lin and **Da-Chuan Cheng**

China Medical University, Taiwan

Abstract—The aim of this study is to develop a fully automated tool on accurate vessel segmentation for cross-section area measurement on ICA, IJV, and VA based on magnitude MR image sequences in order to compute the flow volume change. The CSF is then segmented on phase-contrast MRI in order to compute pressure gradient. Finally the ICCI (intracranial compliance index) can be computed. In total 11 normal cases are tested. Each case is performed three times to test the intra-observer variability of the proposed algorithm. The results show the better performance than the previous manual segmentation method.

April 23, 2017 (Friday)

Venue: Lemongrass (Level 2)

8:30~8:35		<p>Opening Remarks Prof. Patrick Wang Northeastern University, USA</p>
8:35~9:10		<p>Keynote Speech II Prof. David Zhang The Hong Kong Polytechnic University, Hong Kong Topic: <i>“Hand-Based Biometrics”</i></p>
9:10~9:40		<p>Plenary Speech I Prof. Dong-Qing Wei Shanghai Jiaotong University, China Topic: <i>“Personalized Drug in the Era of Big Data and Precision Medicine”</i></p>
9:40~10:10	<p>Group Photo & Coffee Break</p>	
10:10~10:40		<p>Plenary Speech II Assoc. Prof. Gautam Sethi National University of Singapore, Clinical Research Centre, Singapore Topic: <i>“Role of Nimbolide in Prostate Cancer Therapy”</i></p>
10:40~10:55		<p>Invited Speech Dr. Xi Xie Sun Yat-Sen University, China Topic: <i>“Nanoneedle Cell Penetration for Intracellular Drug Delivery”</i></p>
10:55~12:10	<p>Session 2 Venue: Lemongrass (Level 2)</p>	
12:10~13:20	<p>Lunch: The University Club</p>	
13:20~13:50		<p>Plenary Speech III Assoc. Prof. Kwoh Chee Keong Nanyang Technological University, Singapore Topic: <i>“Analyzing the Virulency of Influenza Viruses: Challenges and Solutions”</i></p>

Let's move to the session!

Session 2

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Morning, April 23, 2017 (Friday)

Time: 10:40~12:10

Venue: Lemongrass (Level 2)

Session 2: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Prof. Dong-Qing Wei

S3001-Invited Speech Presentation 1 (10:40~10:55)

Nanoneedle Cell Penetration for Intracellular Drug Delivery

Xi Xie, Hui-Juan Chen, Tian Hang, Jiangming Wu, and Chengduan Yang

Sun Yat-sen University, China

Abstract—Introduction of biomolecules across the cell membrane with high efficiency is a challenging yet critical technique in biomedicine. Vertically nanoneedle arrays have been recently reported to offer new opportunities to access a cells' interior by directly breaching the cell membrane, yet microscopic understanding of how and when the nanowires penetrate cell membranes is still lacking. First, to elucidate the possible penetration mechanisms, a continuum elastic cell mechanics model is presented to address how penetration occurs, and explore the characteristics that affect penetration. Our results reveal that cell penetration is likely to occur only for a limited time window during cell adhesion. The penetration effects of nanoneedle geometry and cell properties are systematically evaluated. Nanoneedle cell penetration efficiency is low, and were unable to achieve efficient DNA plasmid transfection. A nanoneedle-electroporation platform was developed to achieve highly efficient molecular delivery and high transfection yields with excellent uniformity and cell viability. Cellular engulfment of the nanoneedles provides an intimate contact, significantly reducing the necessary electroporation voltage and increasing homogeneity over a large area. Biomolecule delivery is achieved by diffusion through the nanoneedles and enhanced by electrophoresis during pulsing. The system was demonstrated to offer excellent spatial, temporal, and dose control for delivery, as well as providing high-yield co-transfection and sequential transfection.

Morning, April 23, 2017 (Friday)

Time: 10:40~12:10

Venue: Lemongrass (Level 2)

Session 2: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Prof. Dong-Qing Wei

S0010 Presentation 2 (10:55~11:10)

Gene Entity Recognition of Full Text Articles

Manuel Noll, Jonathan Lete and **Patrick Meyer**

Université de Liège, Belgium

Abstract—Biomedical scientific literature is an unexploited treasure. Due to the staggering number of publications it is literally intractable to gather manually all information. Automated information extraction (IE) is therefore key. An important subtask is the recognition of names in the text as specific entities (named entity recognition, NER). NER for genes in biomedical literature is a challenging task. This paper reports preliminary results for the identification of gene names in full text with the naive Bayes, support vector machine and random forest algorithms, showing that there is no loss on performance compared to the gene NER restricted to abstracts.

Morning, April 23, 2017 (Friday)

Time: 10:40~12:10

Venue: Lemongrass (Level 2)

Session 2: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Prof. Dong-Qing Wei

S0015 Presentation 3 (11:10~11:25)

The Relation between the Bone Density and Accuracy of Dental Surgical Guide- a Preliminary Study

Yao-Te Peng, Chun-Chih Tseng, Chih-Han Chang, Chun-Ting Li and Yen-Nien Chen

National Cheng Kung University, Taiwan

Abstract—The bone density of edentulous region might cause the instability of surgical guide. To investigate the relation between bone density and accuracy of guide surgery is still clinical interest. The aim of this study is to evaluate the relation between the factor and accuracy of surgical guide by in vivo test

Five edentulous patients were chosen for implant surgery with surgical guides. The preoperative CBCT photography images were imported into MIRDC Dental software for implant planning. The surgical guides were fabricated by CAM machine. The deviation between planned and placed implants was calculated in implant’s head and apex. The bone density of each implant site was measured from gray value (Hu number) of CBCT image.

From the results, total of 10 implants sites were evaluated. The deviation between planned and placed implants were 1.54 ± 0.79 mm in implant’s head and 1.74 ± 0.77 mm in implant’s apex. The mean bone density was 992 ± 0.79 in Hu number. The correlation coefficients between each deviation and bone density was $R=0.83$. Based on the present results, the bone density seem to affect the accuracy of surgical guide.

Morning, April 23, 2017 (Friday)

Time: 10:40~12:10

Venue: Lemongrass (Level 2)

Session 2: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Prof. Dong-Qing Wei

S0016 Presentation 4 (11:25~11:40)

Biosensor of Urine Analysis Based on Graphene Nano Sheet

Ashraf Abdel Raheem, Ashraf Mahroos, Mohamed Salah, and Ibrahim Ashour

Department of Chemical Engineering, Faculty of Engineering, Minia University, El-Minya, Egypt

Abstract—The aim of this work is to propose a stable and easy technique to analyze urine based on graphene Nano sheet. Where graphene Nano sheets used as a detector and as well as the rate of electrons transfer into the detector. Its theoretical specific surface area is as high as 2630 m² g⁻¹. As a result, the characteristic surface conductivity of graphene makes it a super conductor in a very small size. Urea measurement in urine and blood related to many diseases such as kidney and liver diseases. Sensitive urea measurement in urine and blood really need super conductor graphene sensor, which can read the concentration of urea and translate it to micro and mille ampere at specific voltage then compare them with a normal one. The graphene super conductor material is chemically inert, which can read a very low concentration and make an accurate prediction of theses serious diseases without any effect on the results within a sample; it produces a stable and accurate performance.

Morning, April 23, 2017 (Friday)

Time: 10:40~12:10

Venue: Lemongrass (Level 2)

Session 2: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Prof. Dong-Qing Wei

S0023 Presentation 5 (11:40~11:55)

Amino Acids of Hemagglutinin and Neuraminidase That Provoke Human-to-Human Infection in Avian Influenza Virus

Hayoon Kwon, Myung Yeo, and Taeseon Yoon

Hankuk Academy of Foreign Studies, South Korea

Abstract—There have been many cases of avian influenza outbreaks that humans also suffered from, but among them only one avian flu virus type - H1N1 from the 1918 Spain flu pandemic - showed human-to-human infection. Other avian influenza virus types that have prevailed among humans only showed cases of avian-to-human infections. It is just as well that most of avian influenza viruses don't show human-to-human infection, because if avian flu can be transmitted from humans to humans, avian flu will become a more serious epidemic than SARS - just like the 1918 Spain flu pandemic. Therefore, finding out the specific amino acids of avian flu virus that makes human-to-human infection possible is a critical task in preventing the possible pandemic that may occur due to genetic mutation of virus – the purpose of our study. We compared the amino acids of H1N1, H5N1, H5N2, and H5N6, through experiments using artificial intelligence algorithms - Apriori and Decision Tree algorithm. Through Decision Tree, we decided the most appropriate window size for the experiment, and executed further comparison and analysis via Apriori on that chosen window size. The result showed that G and T in position 5, G in position 8, and S in position 11 (13window) are the Neuraminidase amino acids that all four viruses share in common (which are the amino acids that do not interfere with human-to-human infection). In contrast, not a single amino acid appeared to be common in Hemagglutinin. Moreover, the amino acids that only H1N1 holds (which are the amino acids that may play a role in human-to-human infection) in Neuraminidase turned out to be S in position 2, S in position 3, N in position 5, G in position 6, T in position 10, N in position 11, In Hemagglutinin, every amino acids of H1N1 turned out to be the amino acids that only H1N1 holds, except for S in position 5 and E, N in position 6. Therefore, we suggest these amino acids be studied primarily, since any mutations regarding these amino acids (especially of HA) can pose a fatal threat for humans.

Morning, April 23, 2017 (Friday)

Time: 10:40~12:10

Venue: Lemongrass (Level 2)

Session 2: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Prof. Dong-Qing Wei

S0037 Presentation 6 (11:55~12:10)

The Modeling of Temperature Distributions of an Interstitial Two-Tine Antenna for Hepatic cancer Microwave Ablation

Montree Chaichanyut

King Mongkut’s Institute of Technology Ladkrabang, (KMITL PRINCE CHUMPHON), Thailand

Abstract—Hepatic cancer can be treated by microwave ablation, a therapy in which the goal is to increase the tissue temperature in order to induce necrosis. For the application of microwave ablation interstitial antenna have been developed with the objective of delivering and focusing energy deposition on the tissue in an effective manner. In this study, microwave ablation analyses using 2.45 GHz Two-Tine (2T) antenna for hepatic cancer tissue. This research is designed for a 2T-Conductor back-choke (2T-CBC) and 2T-Dielectrics Back-choke antenna (2T-DBC) and modeled using finite element method to obtain their heating patterns, compare them and analyze the effects of the back-choke to treat by microwave ablation. A preliminary study was first carried out with regard to the specific absorption rates (SAR) along the 2T antenna insertion depths and the ablation zone (heating pattern and lesion volume) inside the hepatic cancer models with 5 cm-in-diameter tumor. All scenarios were simulated under temperature-controlled mode (90°C) and the initial power was set at 50 W. Based on the preliminary results, the result shows that the maximum SAR and lesion volume is higher than when using a 2T-DBC antenna for microwave ablation (97.31 cm³). The conductor tine and bake-choke of the antenna has effect to heating pattern and lesion volume.

Buffet Lunch	
12:10-13:20	Venue: Before Clove Room (Level 2)

Session 3

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

**Session 3: 9 presentations- Topic: “Bioinformatics and Computational
Biology”**

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0040 Presentation 1 (13:50~14:05)

Jahan Razavi and Ted Shinta

Monta Vista School, USA

Abstract—This paper presents a system that helps the blind detect topography changes on the floor and the ground such as steps and other obstacles. A simple, efficient approach measures the distance from the user’s head to the ground and detects changes that represent a step up or a step down. The system consists of an ultrasound radar, a gyroscope, an Arduino Nano, and two buzzers. The wearer’s height is measured by calibration: he/she turns on a switch while on a flat surface to find the reference distance. Measured results indicate that the rate of false alarms depends on both the subject’s height and his/her walking gait.

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

**Session 3: 9 presentations- Topic: “Bioinformatics and Computational
Biology”**

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0035 Presentation 2 (14:05~14:20)

Automatic Braking System and Fall Detection Mechanism for Rollators

Monica Azqueta-Gavaldon, Inigo Azqueta-Gavaldon, Matthias Woiczinski, Kai Bötzel, and Eduard Kraft

Ludwig Maximilians University (LMU), Germany

Abstract—Four wheel walkers or rollators are a useful device to help the elderly to walk independently. Nevertheless, the use of such devices is not always desired by the elderly since they sometimes fail to provide stability during forward falls. If the brakes of the rollators are not immediately engaged during tripping or “freezing” episodes, a forward fall can be inevitable. Taking into consideration this issue, an automatic braking system for rollators was designed and tested. This system works by using a depth camera that monitors the distance of the user to the rollator, and when a critical distance is exceeded, the brakes engage. The system was tested for different velocities and with different types of forward falls and proved to be able to recognize falls with high accuracy.

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

**Session 3: 9 presentations- Topic: “Bioinformatics and Computational
Biology”**

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0004 Presentation 3 (14:20~14:35)

Mental Fatigue Measurement using Visual Synchronization Tasks

Kyota Aoki

Utsunomiya University, Japan

Abstract—There are peg-board test and tap synchronization test as a method to measure the motion control function. These tests measure only the result of motion, and do not the process. By measuring the whole process from the beginning to the end of a test, it is possible to obtain data that are more detailed. The through measurement of a motion process enables to measure the precise performance of the motor control function. This paper discusses visual synchronization task to measure the performance of our brain using periodic motion of both hands for estimating the mental fatigue caused from a mental workload. A visual synchronization task requests a subject to flip the palms of both hands synchronizing the displayed hands' motion. The method measures the poses of both perms through the task. From the measurements in the process of this task, the method evaluates the performance of the motion control function of the subject. This paper discusses the descriptive power of the visual synchronization task to estimate the mental fatigue. The visual synchronization task is safe, because there is no need to attach the device to a subject nor to make gross motions. The task is short to complete. This paper presents the experiments and evaluates the descriptive power of the visual synchronization task to measure mental fatigue.

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

**Session 3: 9 presentations- Topic: “Bioinformatics and Computational
Biology”**

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0013 Presentation 4 (14:35~14:50)

Numerical Study on the Dynamics of Organism Motion under Background Flow

Ranjith Maniyeri and Sangmo Kang

National Institute of Technology Karnataka (NITK), Surathkal, India

Abstract—We propose a two-dimensional numerical model to investigate the dynamic behaviour of an organism swimming in a background flow in a channel. In this work, the organism is modeled as a neutrally buoyant one-dimensional elastic filament based on an immersed boundary finite volume method. Further, the organism is modeled using discrete number of immersed boundary points and the Navier-Stokes equations governing the flow are solved on a staggered Cartesian grid system. A driving function is applied which results in a wave travelling along the length of the organism from left to right. It is found that under no background flow, the organism swim in the forward direction (right to left) when the wave travel over the organism is in the opposite direction. It is observed that, under a uniform background flow, a non-motile organism is simply dragged by the flow whereas a motile organism swims backward along the direction of flow. Further, it is seen that a propulsion enhancement is found in the case of organism swimming along the flow direction when the wave travel is in the opposite direction as that of the flow.

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

**Session 3: 9 presentations- Topic: “Bioinformatics and Computational
Biology”**

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0018 Presentation 5 (14:50~15:05)

Understanding Mutational Effects on Binding Affinity of Protein-Protein Complexes through Database Development and Analysis

Michael Gromiha, Sherlyn Jemimah, and Kamma Yugandhar

Indian Institute of Technology Madras, India

Abstract—Protein-protein interactions (PPIs) play crucial roles in many biological processes and responsible for smooth functioning of the machinery in living organisms. Understanding and predicting the binding affinity of protein-protein complexes is a challenging task in computational biology. We have developed an energy based approach for identifying the binding sites in protein-protein complexes and revealed the important interactions for binding. Utilizing this information along with other physicochemical features we have developed a model for discriminating high and low affinity complexes and predicting the binding affinity of protein-protein complexes using machine learning techniques. In this work, we have focused on understanding the effect of amino acid mutations on the binding affinity of protein-protein complexes. We have developed a database, which contains more than 6000 data on binding affinity of protein-protein complexes upon mutations along with other sequence, structure, function and literature information as well as experimental conditions. Utilizing the free energy change, we have analyzed the additivity effect of binding free energy change of double mutants. We observed a good correlation between the free energy change of double mutant and their sum of single mutants. The salient features of the results will be discussed.

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

**Session 3: 9 presentations- Topic: “Bioinformatics and Computational
Biology”**

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0026 Presentation 6 (15:05~15:20)

Functional Annotation of Hypothetical Proteins of *Lactobacillus Rhamnosus*: An In Silico Approach

Priyanka Kumari, Arpit Singh, and Yasha Hasija

Delhi Technological University, India

Abstract—Probiotic bacterium, *Lactobacillus rhamnosus* (LR24) is widely used in the food and nutraceutical industries owing to its numerous health benefits and industrial applications. To efficiently use the bacterium, various genetic engineering techniques and strategies are in use like Genome shuffling, Anti-sense RNA technology and so forth. It is really important to understand the system biology and metabolism of this bacterium and hence the proteome analysis of the bacterium becomes an essential research prospect. However, in NCBI-Genome out of 2640 proteins, 420 are termed hypothetical. Adding functional information to these hypothetical proteins has become strategically important to study systems level and metabolic pathway analysis of the bacterium. The present study focuses on using the in silico strategies like homology analysis based on sequence similarity, sub-cellular localization prediction, domain extraction, searching for essential proteins, mapping with gene ontology terms and functional annotation. Out of 420 proteins, total 46 proteins were annotated and among them 18 proteins were known to have homologs in the Database of essential genes (DEG). Out of 18 proteins, One protein KFK47528.1 had the maximum no.(55) of homologs with DEG so it was modeled with good confidence and query coverage. Overall approach was to assign a putative function to the hypothetical proteins by integrating the information obtained from the various resources. This study also reports a need to develop a standardized pipeline based on intelligent learning with fast and exhaustive approach to solve the biological problem of accumulating hypothetical proteins.

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

**Session 3: 9 presentations- Topic: “Bioinformatics and Computational
Biology”**

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0033 Presentation 7 (15:20~15:35)

Glia Enhanced the Formation of Spatiotemporal Motifs in Cultured Networks

Meng-Tee Kwek, Siew-Ying Mok, and Sing-Yau Goh

Universiti Tunku Abdul Rahman, Malaysia

Abstract—We examine the effects of glia on the formation of spatiotemporal motifs, by tracking the spontaneous dynamics of cultured neuronal networks with different amount of glia growing on multi-electrode arrays. These recurring activity patterns were regarded as memory templates or substrates of information in the standalone networks. Repeating spatiotemporal motifs were consistently detected only in high glial and low glial cultures but not in glia-free cultures, with high glial cultures displayed spatiotemporal structures of relatively higher precision. Our results suggest the role of neuron-glia interactions in modulating memory and learning *in vivo*.

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

**Session 3: 9 presentations- Topic: “Bioinformatics and Computational
Biology”**

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0044 Presentation 8 (15:35~15:50)

Time-Frequency Methods for Diagnosing Alzheimer’s Disease from EEG – A Technical Review

Bibina V. C., Upasana Chakraborty, Mary Lourde R, and Ajith Kumar

Birla Institute of Technology & Science Pilani, Dubai Campus, UAE

Abstract—Alzheimer’s Disease (AD) is the most common form of Dementia prevailing in the old generation. This review paper aims to put forward different non-invasive methods and tools that are available for the diagnosis of people suffering from Alzheimer’s and other forms of dementia. It explains why Electroencephalography (EEG) signal analysis is considered a better method compared to others and also the safest one. Non-stationary and not deterministic nature of EEG signals make them difficult to be analyzed. This paper provides an introduction to various time-frequency domain methods which facilitate the analysis in both the domains together thus making it easier to analyze such signals. The paper also reviews several work done towards the improvement of biomarkers which can help in early detection of such neurodegenerative disorders. Several methods discussed in this paper can help to differentiate between a healthy control (HC) and one suffering from AD or Mild Cognitive Impairment (MCI).

Afternoon, April 23, 2017 (Friday)

Time: 13:50~16:05

Venue: Lemongrass (Level 2)

Session 3: 9 presentations- Topic: “Bioinformatics and Computational Biology”

Session Chair: Assoc. Prof. Kwoh Chee Keong

S0021 Presentation 9 (15:50~16:05)

Discovering Anti Aging Drugs Utilizing Unsupervised Learning and Pharmacokinetic Study

Priyanka Kumari, Abhigyan Nath, and Yasha Hasija

Delhi Technological University, India

Abstract—Ageing is a multilevel and multifaceted process of getting older characterized by physical, physiological, psychological and social changes. It is a phenomenon of growth, decline and death. Aging remains an unanswered question in the medical field. There are currently very limited FDA-approved anti-aging drugs available in the market. The discovery of new pharmacotherapies and new approaches to drug development are needed. Interaction study was implemented on three drugs namely Resveratrol, Aspirin and Metformin followed by clustering analysis of interacting partners of these drugs to identify novel candidate drugs for aging. ADMET analysis indicated five drugs having compound ID(CID005910817),(CID4634), (CID5508),(CID26986) and (CID3158) followed all the rules of drug likeliness and Out of 5 only one compound i.e. CID005910817 passed non-drug likeliness filters and was predicted to be non-toxic also. We propose that Phenyl caffeate(CID5910817) could be a potential anti- aging drugs. Target validation proved that it has targets which are involved in aging. DFT study proves that the proposed drug is stable, bioactive and could be used for further clinical analysis. The present study would certainly provide new solution to the pharmaceuticals against aging and age related disorders.



16:05-16:30

Coffee Break

Session 4

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, April 23, 2017 (Friday)

Time: 16:30~18:00

Venue: Lemongrass (Level 2)

Session 4: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Assoc. Prof. Q. Memon

S0012 Presentation 1 (16:30~16:45)

Numerical Evaluation of Fragment Shape and Screw Configuration in the Fixation of Tibial Tubercle Osteotomy

Yen-Nien Chen, Chih-Wei Chang, Chih-Han Chang, Chun-Ting Li, and Yao-Te Peng

National Cheng Kung University, Taiwan

Abstract—Tibial tubercle osteotomy (TTO) is commonly used for its better exposure and field and less violation of soft tissue in the revision total knee arthroplasty. To date, the effects of various screw configurations on the stability of TTO are not completely understood and the stability mechanism of TTO fixed with screws remains unknown. Therefore, the aim of this study is to investigate the stability of TTO with various fragment shapes and fixed with various screw configurations by finite element (FE) method. A tibia with TTO model was developed in this study. Totally two different types of fragment shapes and three different types of screw configurations were used in the present simulation. Those fragment shape included the superior surface of the fragment perpendicular and parallel to the longitudinal axis of tibia and those screw configuration included two parallel horizontal screws, two parallel down-ward screws and two diverge screws. The results indicated that the fragment shape affected the stability more than the screw configuration and the fragment with superior surface perpendicular to the longitudinal axis of tibia resulted in highest structural stability with least displacement of the fragment in identical loading. Among those screw configurations two parallel down-ward screws resulted in highest stability in identical fragment shape. Based on the present results, the fragment with superior surface perpendicular to the longitudinal axis and with two parallel down-ward screws for fixation is suggest in the management of tibial tubercle osteotomy.

Afternoon, April 23, 2017 (Friday)

Time: 16:30~18:00

Venue: Lemongrass (Level 2)

Session 4: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Assoc. Prof. Q. Memon

S0041 Presentation 2 (16:45~17:00)

Residual Gas Analyzer-Mass Spectrometry for Human Breath Analysis: a New Tool for Noninvasive Diagnosis of Helicobacter Pylori Infection

Abhijit Maity and Manik Pradhan

S. N. Bose National Centre for Basic Sciences, Kolkata, India

Abstract—A residual gas analyzer (RGA) coupled with a high vacuum chamber is described for noninvasive diagnosis of Helicobacter pylori infection through ^{13}C -urea breath analysis. The present RGA-based mass spectrometry (MS) method is capable of measuring high-precision $^{13}\text{CO}_2$ isotope enrichments in exhaled breath samples from individuals harboring H. pylori infection. The system exhibited 100% diagnostic sensitivity, 93% specificity alongside positive and negative predictive values of 95% and 100%, respectively compared with the invasive endoscopy-based biopsy tests. A statistically sound diagnostic cut-off value for the presence of H. pylori was determined to be 3.0‰ using a receiver operating characteristics curve analysis. The diagnostic accuracy and the validity of the results are also supported by optical off-axis integrated cavity output spectroscopy measurements. The $\delta^{13}\text{C}$ DOB values of both methods correlated well ($R^2=0.9973$ at 30 min). The RGA-based instrumental setup described here is simple, robust, easy-to-use, more portable and cost-effective compared to currently available all other detection methods, thus making it a new point-of-care medical diagnostics for large-scale screening purposes of H. pylori infection in real time. The RGA-MS technique should have broad applicability for ^{13}C -breath tests in a wide range of biomedical research and clinical diagnostics for many other diseases and metabolic disorders.

Afternoon, April 23, 2017 (Friday)

Time: 16:30~18:00

Venue: Lemongrass (Level 2)

Session 4: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Assoc. Prof. Q. Memon

S0042 Presentation 3 (17:00~17:15)

Natural ^{18}O and ^{13}C -Urea in Gastric Juice Tracks Selectively Peptic Ulcer Disease, Non-Ulcerous Dyspepsia and Helicobacter Pylori

Mithun Pal and Manik Pradhan

S. N. Bose National Centre for Basic Sciences, Kolkata, India

Abstract—The ^{13}C -urea breath test (^{13}C -UBT), developed a few decades ago, is widely used as a non-invasive diagnostic method to detect only the presence of the gastric pathogen *Helicobacter pylori* infection; however, the actual disease state, i.e. whether the person harbouring *H. pylori* has peptic ulcer disease (PUD) or non-ulcerous dyspepsia (NUD), is still poorly understood. Nevertheless, the present ^{13}C -UBT has numerous limitations, drawbacks and pitfalls owing to the ingestion of ^{13}C -labelled external urea. Here, we show that *H. pylori* is able to utilize the natural ^{13}C and ^{18}O -urea inherently present in the gastric juice in humans for its urease activity which has never been explored before. In vitro measurements of isotopic fractionations of gastric juice urea provide new insights into the actual state of the infection of PUD or NUD. We also provide evidence of the unusual ^{13}C and ^{18}O -isotopic fractionations of breath CO_2 that are distinctively altered in individuals with PUD encompassing both gastric and duodenal ulcers as well as with NUD by the enzymatic activity of *H. pylori* in the gastric niche without oral administration of any ^{13}C -enriched external urea. This deepens our understanding of the UBT exploiting the natural ^{13}C and ^{18}O -gastric juice urea in the pathogenesis of *H. pylori* infection, reveals the actual disease state of PUD or NUD and thus offers novel opportunities for a simple, robust, cost-effective and non-toxic global strategy devoid of any ^{13}C -enriched urea for treating these common diseases by a single breath test.

Afternoon, April 23, 2017 (Friday)

Time: 16:30~18:00

Venue: Lemongrass (Level 2)

Session 4: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Assoc. Prof. Q. Memon

S0009 Presentation 4 (17:15~17:30)

Identification of Potential Critical Virulent Sites Based on Hemagglutinin of Influenza a Virus in Past Pandemic Strains

Rui Yin, Xinrui Zhou, Fransiskus Xaverius Ivan, Jie Zheng, Vincent T. K. Chow, and **Chee Keong Kwoh**

Nanyang Technological University, Singapore

Abstract—The influenza pandemics have caused millions of deaths and enormous economic loss. Current circulating influenza viruses in human, avian, swine and other animals are potential to evolve into novel strains that may cause another pandemic in the future. Hence, recognizing the determinants of pandemic strains helps to raise the alarm of future pandemics. With increasingly huge biological data, computational modeling is a good technique for analyzing data, providing novel insight into significant patterns and rules. Here we define a binary classification problem of categorizing influenza strains into pandemic and non-pandemic classes based on amino acid sequences. Three rule-based algorithms are applied, namely OneR, JRip and PART, to extract rules, composed of potential critical virulent sites. The results present good performance in term of accuracy, specificity, sensitivity and F-measure (more than 0.9 on average for each). Fourteen out of the sixteen potential critical virulent sites detected in our experiments are overlapped with receptor binding sites or antigenic sites. In addition, some variations occurred in these sites are known to affect the pathogenicity of influenza viruses or to cause more severe symptom in the infected patients. The pandemic potential of uncovered sites in our study needs to be further experimentally validated.

Afternoon, April 23, 2017 (Friday)

Time: 16:30~18:00

Venue: Lemongrass (Level 2)

Session 4: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Assoc. Prof. Q. Memon

S0045 Presentation 5 (17:30~17:45)

Fast Alignment of Three-Dimensional Dental Arch Models for Digital Impressions

Chia-Hsiang Wu, Tzu-Huai Wu, and Yao-Ning Lei

I-Shou University, Taiwan

Abstract—3D scanning of the teeth is required in digital impressions. Due to limited field of view of the scanner, the user has to scan from multiple viewpoints and register the partially scanned models. In this study, we investigate how to fast and efficiently register 3D dental arch models for an intraoral scanning system. Given two partial overlapped dental arch models, we find the translation between models based on the geometry of human arches. Then, we fix the angle discrepancy between two models using principal component analysis. The rigid transformation, including translation and rotation, between models are estimated by a closed form solution, according to singular value decomposition, so that the two models are aligned. The optimization is carried out by of the transformations relies on corresponding points between the models. The correspondences are determined by the projection along the normal direction of tangent plane for a point. Moreover, we use k-d tree and data point sampling to accelerate the determination of correspondences. The experimental results show that the alignment of models is successful and computation time is typical within 5 seconds.

This study was supported by the Ministry of Science and Technology of Taiwan under grant no. MOST 105-2221-E-214-015.

Afternoon, April 23, 2017 (Friday)

Time: 16:30~18:00

Venue: Lemongrass (Level 2)

Session 4: 6 presentations- Topic: “Basic Medicine and Biomedical Engineering”

Session Chair: Assoc. Prof. Q. Memon

S0024 Presentation 6 (17:45~18:00)

Patient-Friendly Visual Rehabilitation EMG Biofeedback with TENS Pain Relief Module based on Android Platform

Abubakr Mustafa, Mazin Yassin, and Ashraf Mahroos

Minia City, Minia, Egypt

Abstract—The aim of this paper is to introduce an integrated system for accurate and easy rehabilitation process. A small gadget connected wirelessly by android application for on line follow up and continuous enhancement with affordable cost. Acquiring and signal processing is implemented by application for both patient and doctor. Patient application process and enhance signal for patient rehabilitation, these acquisitions were sent to the doctor application to follow the rehabilitation progress. The Proposed system gives patients the ability to follow their progress, be exited and do their exercises and rehabilitation processes very well. The design and implementation of Muscle Rehabilitation Enhancement and Control System has been proposed. Pain relief system in portable and affordable small size kit for injured muscle has been implemented. Pain control stimulator “TENS” protocol that outputs a pulsed biphasic current has been manipulated for accuracy and patient safety. Implementation designed to reduce acute, chronic, and postoperative pain, as well as postoperative analgesic medication consumption that last for 24 hours.



Dinner	
18:00	The University Club

Poster Session

June 23, 2017 (Friday)

Time: 8:30~18:00

Venue: Lemongrass (Level 2)

Poster Session: 8 presentations

S0003 Poster 1

Silver Nanowire-Laden Conductive Hydrogel Micropattern

Jong Min Lee and Bong Geun Chung

Department of Mechanical Engineering, Sogang University, Seoul, Korea

Abstract—We developed a silver nanowire-laden conductive hydrogel to control neural stem cell differentiation. The hydrogel micropattern can produce electrical stimuli directed by the functional generator. We observed neural stem cells cultured within 10% polyethylene-based photo-crosslinkable hydrogels for 7 days. The electrical impulses were modulated to one electrical stimulation every 2 hours. Enhanced neural proliferation and differentiation was observed with increasing electrical stimulation in the silver nanowire-laden hydrogel pattern. Therefore, this silver nanowire-laden conductive hydrogel could be effective towards treating different neurodegenerative diseases.

June 23, 2017 (Friday)

Time: 8:30~18:00

Venue: Lemongrass (Level 2)

Poster Session: 2 presentations

S0036 Poster 2

BetaCons: Protein β -sheet Prediction Using Consensus of Predicted Superior Conformations

Mostafa Sabzekar, Mahmoud Naghibzadeh, Majid Sazvar, Toktam Dehghani, Behareh Behkamal and Mahdie Eghdami

Ferdowsi University of Mashhad, Iran

Abstract—Protein β -sheet structure prediction is one of the most critical and challenging intermediate steps towards the full identification its tertiary structure due to the presence of non-local interactions. As a result, defining scoring functions for different levels of β -sheet structure prediction (i.e., contact map, pairing β -strands and their arrangements in β -sheets) is a critical task. Thus, the optimum conformation, which is determined by the existing functions, have some inaccuracies. Here, to achieve more reliable solution, we propose an algorithm that utilizes a structural consensus of superior conformations. The algorithm is proposed in such a way that each selected conformation contributes in making the result based on its rank. For this purpose, we create a complete directed weighted strand pairing graph and then find the maximum spanning subgraph of the presented graph as an output of the problem. Experimental results showed significant improvements in the prediction accuracy.

June 23, 2017 (Friday)

Time: 8:30~18:00

Venue: Lemongrass (Level 2)

Poster Session: 8 presentations

S0020 Poster 3

A Sitting Balance Training Robot for Trunk Rehabilitation of Acute and Subacute Stroke Patients

Zhishang Song, Linhong Ji, Rencheng Wang, Qiong Wu, Xiaohua Sun, and Senchao Fan

Lab of Intelligent and Biomimetic Machinery, State Key Laboratory of Tribology, Tsinghua University, China

Abstract—Objective: to test the stability of a sitting balance training robot and to verify the physiological effects on trunk muscles during the robot training.

Method: fundamental experiment and robot test experiment were conducted. EMG and kinematic data were recorded from six healthy subjects and five stroke patients. Three pairs of trunk muscles were included in our observation. They are erector spinae (ES), rectus abdominis (RA) and external oblique (EO).

Results: contralateral ES was more engaged in actively bending while ipsilateral ES in passively tilting. Healthy subjects activated ES when sitting and lateral bending, while stroke patients activated EO and RA in addition to ES. Resisting against pushing force at bending posture had a similar activation on ES, comparing with passively tilting by the robot. EMG amplitude of ES in actively bending experiment is similar to that in passively tilting on the robot.

Conclusion: This robot could activate the erector spinae of subjects in the lateral bending motion. The stroke patients have weak ES in comparison with healthy subjects. ES is a proper reflector of trunk motions and can be further studied to evaluate trunk capacity of patients.

June 23, 2017 (Friday)

Time: 8:30~18:00

Venue: Lemongrass (Level 2)

Poster Session: 8 presentations

S0029 Poster 4

Heart Sound Signals Based on CNN Classification Research

Sunjing, Kang Lifu, Wang Weilian, and Songshaoshuai

School of Information Science and Technology, Yunnan University, China

Abstract—Heart sound signal can provide complex physiological and pathological information while diagnosing CHD(congenital heart disease). The main procedure includes pretreatment, Envelope extraction, classification and recognition. Pretreatment includes normalization, de-noising, envelope extraction, etc. Then, segment the heartbeat signal through Hilbert Envelope to confirm the first heart sound and the second heartbeat. After that, take logarithm of the periodic signal of the heartbeat to get Hilbert Energy Spectrum. Take the result as characteristic variable and put it into convolution neural network to train the study. The main innovation of this paper is using the convolution neural network to identify the heart sound pattern. The experiment results have a very high correct rate by using CNN (convolutional neural network) compared with other methods.

June 23, 2017 (Friday)

Time: 8:30~18:00

Venue: Lemongrass (Level 2)

Poster Session: 8 presentations

S0031 Poster 5

A Review: Exome Sequencing in Tumors

Han Zeng, Le Zhang, and Ming Xiao

Southwest University, China

Abstract—The next-generation sequencing (NGS) is very important for genetics. One of the most popular sequencing approaches is exome sequencing, which is a lower cost and high-throughput sequencing method. Here, this study first reviews the history of next-generation sequencing and exome sequencing. And then, it illustrates four genetic variants in tumor as well as the application of the exome sequencing for cancer research. Finally, it discusses the current analysis methods for exome sequencing and related tools.

June 23, 2017 (Friday)

Time: 8:30~18:00

Venue: Lemongrass (Level 2)

Poster Session: 8 presentations

S0032 Poster 6

The High Performance Computing Applications for Bioinformatics Research

Jia-kun Li, Le Zhang, and Ming Xiao

Guangxi Teacher Education University, Nanning, China

Abstract—This study reviews the current high performance computing applications for bioinformatics. Firstly, we introduce two popular high performance computing architecture such as single instruction multiple data (SIMD) and multiple instruction multiple data (MIMD). For SIMD, we employ CUDA as the example to show its popular applications. Here, we detail three CUDA related high performance computing applications for bioinformatics research, such as GPU-BLAST, CloudAligner and SEAL. For MIMD, we employ Hadoop as the example to show its popular applications. Here we detail three Hadoop related high performance computing applications for bioinformatics research, such as Cloudburst, SOAP3 and CLAST. Finally, we summarize the aim of the research.

June 23, 2017 (Friday)

Time: 8:30~18:00

Venue: Lemongrass (Level 2)

Poster Session: 8 presentations

S0038 Poster 7

The Quick Prediction of Chlorophyll on Living Pepper Canopy with Different Nitrogen Treatment Based on Hyper-Spectral Image

Yan Yang

Guangxi Teacher Education University, Nanning, China

Abstract—The value of chlorophyll can be used to reflect the nitrogen nutrition of plant. By monitoring chlorophyll, we can master the growth condition of plant in time and accordingly adjust fertilization stratagem, which will made cultivation more efficient. The paper present an innovative approach, which implement the quick prediction of chlorophyll on living pepper canopy with different nitrogen treatment. The hyper-spectral image system in range (400nm-1100nm) was applied to attain hyper-spectral images of living pepper canopy, meanwhile, the leaves on the canopy were sampled to test chlorophyll concentration with biochemical method. We sampled the calibration sets with 150 samples, the prediction sets with 39 samples. After extracting spectrums from sample images, we combined different spectrum pre-processing methods with different modeling algorithms to construct chlorophyll prediction model. The results showed that OSC-SVMR could produce the best prediction. The OSC-SVMR model yielded a reasonable accuracy with $R_c=0.81$, $RMSEC=0.196$ mg/g for calibration data and with $R_p=0.80$, $RESEP=0.237$ mg/g for prediction data. At last, we also predicted chlorophyll of the whole new pepper plant and visualized the distribution of chlorophyll on canopy.

June 23, 2017 (Friday)

Time: 8:30~18:00

Venue: Lemongrass (Level 2)

Poster Session: 8 presentations

F0002 Poster 8

Botnet Traffic Analysis Using Flow Graphs

Wahid Hussain, Nazar Abbas Saqib, Muazzam A. Khan, and Wasi Haider Butt

Department of Mechanical Engineering, Sogang University, Seoul, Korea

Abstract—We developed a silver nanowire-laden conductive hydrogel to control neural stem cell differentiation. The hydrogel micropattern can produce electrical stimuli directed by the functional generator. We observed neural stem cells cultured within 10% polyethylene-based photo-crosslinkable hydrogels for 7 days. The electrical impulses were modulated to one electrical stimulation every 2 hours. Enhanced neural proliferation and differentiation was observed with increasing electrical stimulation in the silver nanowire-laden hydrogel pattern. Therefore, this silver nanowire-laden conductive hydrogel could be effective towards treating different neurodegenerative diseases.

One Day Tour

9:00-17:00 June 24, 2017 (Saturday)



8:45 Gathering at Bay Hotel Singapore lobby

9:00 Setting out and 35 minutes' drive to Merlion Park

9:35-10:10 Merlion Park

Merlion Park is a Singapore landmark and major tourist attraction, located at One Fullerton, Singapore, near the CBD. The Merlion is a mythical creature with a lion's head and the body of a fish that is widely used as a mascot and national personification of Singapore. Two Merlion statues are located at the park. The original Merlion structure measures 8.6 meters tall and spouts water from its mouth. It has subsequently been joined by a Merlion cub, which is located near the original statue and measures just 2 metres tall.

5 minutes' walk to Esplanade Theatre

10:15-11:00 Esplanade Theatre

Esplanade Theatre is a 60,000 square metres performing arts centre located in Marina Bay near the mouth of the Singapore River. Named after the nearby Esplanade Park, it consists of a concert hall which seats about 1,800 and a theatre with a capacity of about 2,000 for the performing arts.

5 minutes' walk back to Merlion Park, then about 10 minutes' drive to Clarke Quay

11:10-11:50 Clarke Quay

Clarke Quay is a historical riverside quay in Singapore, located within the Singapore River Planning Area. The quay is situated upstream from the mouth of the Singapore River and Boat Quay.

10 minutes' drive to Chinatown

12:00-13:00 Lunch time at Chinatown (Please pay by yourself)

13:00-14:10 Chinatown (You can shopping here or visit the Chinatown Heritage Centre,

ticket fee is 15S/P, please pay by yourself)

The Chinatown Heritage Centre is the gateway for all visitors to trace the footsteps of Singapore's early pioneers and discover the personal stories of people who made Chinatown their home.

Located within three beautifully-restored shophouses on Pagoda Street, the Chinatown Heritage Centre is the only place in Singapore that has recreated the original interiors of its shophouse tenants in the 1950s, offering a rare glimpse into the lives of Chinatown's early residents.

15 minutes' drive to Gardens by the Bay

14:25-15:30 Gardens by the Bay

Gardens by the Bay is a nature park spanning 101 hectares (250 acres) of reclaimed land in central Singapore, adjacent to the Marina Reservoir. The park consists of three waterfront gardens: Bay South Garden, Bay East Garden and Bay Central Garden. The largest of the gardens is Bay South Garden at 54 hectares (130 acres). Gardens by the Bay is part of a strategy by the Singapore government to transform Singapore from a "Garden City" to a "City in a Garden". The stated aim is to raise the quality of life by enhancing greenery and flora in the city.

15 minutes' drive to St Andrew's Cathedral

15:45-16:30 St Andrew's Cathedral

St Andrew's Cathedral is an Anglican cathedral in Singapore, the country's largest cathedral. It is located near City Hall, MRT Interchange in the Downtown Core, within the Central Area in Singapore's central business district. It is the Cathedral church of the Anglican Diocese of Singapore and the mother church of her 27 parishes and more than 55 congregations here. The logo of the Cathedral is the St Andrew's Cross. The Year 2006 marks the 150th Anniversary of the St Andrew's Church Mission since 1856.

17:00 30 minutes' drive back to Bay Hotel Singapore lobby

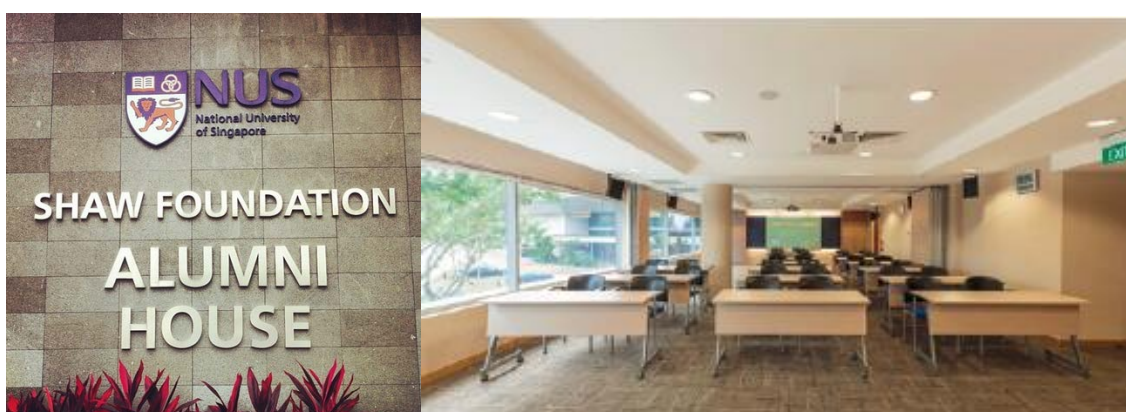
Conference Venue

National University of Singapore, Shaw Foundation

Alumni House

Add: 11 Kent Ridge Drive, Singapore 119244

Tel : (+65) 6516 7700 Fax : (+65) 6464 1498 Email: sfahvenues@nus.edu.sg



As a focal point for alumni activities organized by the NUS Office of Alumni Relations, the Shaw Foundation Alumni House plays host to a variety of exciting events and programs throughout the year. Opened in March 2009, the building houses an auditorium, several seminar rooms, food and beverage outlets, and an Alumni Service Centre to meet the social, business and professional needs of alumni. Whether you need to organize small meetings, full day seminars for a few hundred attendees, or networking events where participants can walk around and interact freely, we have the perfect venue for you. Managed by the NUS Office of Alumni Relations, the Shaw Foundation Alumni House boasts a seamless combination of lush gardens, beautiful interiors and state-of-the-art audio and video systems, making it your choice venue for special events.



Feedback Information

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Where did you get the conference information?					
Would you please specify the main reason for attending this conference?					
Did the conference fulfill your reason for attending?	Yes– Absolutely <input type="checkbox"/> Yes- But not to my full extent <input type="checkbox"/> No <input type="checkbox"/> (If “No”, please tell us the main reason)				

2017 SINGAPORE CONFERENCE

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<p>Any Other Suggestions/Comments</p>	

Thank you for taking time to participate in this conference evaluation. Your comments will enable us to execute future conferences better and tailor them to your needs!