2018 CBEES-BBS SHENZHEN, CHINA CONFERENCE ABSTRACT

2018 International Conference on Computing and Pattern Recognition (ICCPR 2018)

June 23-25, 2018

Harbin Institute of Technology, Shenzhen, China

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Poster Session

Introduction

Welcome to 2018 International Conference on Computing and Pattern Recognition (ICCPR 2018) which is sponsored by Hong Kong Chemical, Biological & Environmental Engineering Society (CBEES) and Biology and Bioinformatics (BBS). The objective of 2018 International Conference on Computing and Pattern Recognition (ICCPR 2018) 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 Computing and Pattern Recognition.

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

International Conference Proceedings by ACM (ISBN: 978-1-4503-6471-3), which will be archived in the 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).

Some selected refereed papers describing the state-of the-art topics will be considered for publication in the **International Journal of Machine Learning and Computing (IJMLC) (ISSN: 2010-3700)**, which will be indexed by Scopus, EI (INSPEC, IET), Google Scholar, Crossref, ProQuest, Electronic Journals Library, and DOAJ.

Conference website and email: http://www.iccpr.org/; iccpr@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):

Regular Oral Presentation: about **12** Minutes of Presentation and **3** Minutes of Question and Answer
Keynote Speech: about **40** Minutes of Presentation and **5** Minutes of Question and Answer
Plenary Speech: about **40** Minutes of Presentation and **5** Minutes of Question and Answer
Invited Speech: about **15** 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 24, 2018.

Keynote Speaker Introduction

Keynote Speaker I

Prof. Yuan-Ting Zhang

City University of Hong Kong, Hong Kong

Prof. Yuan-Ting Zhang is currently the Chair Professor of Biomedical Engineering at City University of Hong Kong. He was the Sensing System Architect in Health Technology at Apple Inc., California, USA in 2015. He was the founding Director of the Key Lab for Health Informatics of Chinese Academy Sciences (2007-2018). Professor Zhang dedicated his service to the Chinese University of Hong Kong from 1994 to 2015 in the Department of Electronic Engineering, where he served as the first Head of the Division of Biomedical Engineering and the founding Director of the Joint Research Center for Biomedical Engineering. Prof. Zhang was the Editor-in-Chief for IEEE Transactions on Information Technology in Biomedicine. He served as Vice Preside of IEEE EMBS, Technical Program Chair of EMBC'98, and Conference Chair of EMBC'05.Prof. Zhang is currently the Editor-in-Chief for IEEE Reviews in Biomedical Engineering, Chair of 2018 Gordon Research Conference on Advanced Health Informatics, Chair of the Working Group for the development of IEEE 1708 Standard on Wearable Cuffless Blood Pressure Measuring Devices, and Chair of 2016-2018 IEEE Award Committee in Biomedical Engineering. Prof. Zhang's research interests include cardiovascular health informatics, unobtrusive sensing and wearable devices, neural muscular modeling and pHealth technologies. He was selected on the 2014, 2015, 2016 and 2017 lists of China's Most Cited Researchers by Elsevier. He won a number of international awards including IEEE-EMBS best journal paper awards, IEEE-EMBS Outstanding Service Award, IEEE-SA 2014 Emerging Technology Award. Prof. Zhang is elected to be IAMBE Fellow, IEEE Fellow and AIMBE Fellow for his contributions to the development of wearable and m-Health technologies.

Topic: *"Cardiovascular Health Engineering: MINDS Design for Wearable and Flexible Sensing Systems*"

***Abstract*—**This talk will outline some of our research work in health engineering which attempts a convergence approach to integrate technologies across multiple scales in the biological hierarchy from molecular, cell, organ to system for the prediction of cardiovascular

diseases (CVDs). The presentation will focus on the development of unobtrusive wearable 'MINDS' technology for cuffless blood pressure estimation and its integration with nano-biomarker detection, medical imaging and machine learning for the early prediction of acute CVDs. Using the atherosclerotic plaque assessment as an example, this talk will also attempt to illustrate that the health convergence approach should allow the practice of 8- P's medicine that is predictive, preventive, precise, pervasive, personalized, participatory, preemptive, and patient-centralized.

Keynote Speaker II

Prof. Cheng-Lin Liu

Chinese Academy of Sciences, China

Cheng-Lin is a Professor at the National Laboratory of Pattern Recognition (NLPR), Institute of Automation of Chinese Academy of Sciences, Beijing, China, and is now the director of the laboratory. He received the B.S. degree in electronic engineering from Wuhan University, Wuhan, China, the M.E. degree in electronic engineering from Beijing Polytechnic University, Beijing, China, the Ph.D. degree in pattern recognition and intelligent control from the Chinese Academy of Sciences, Beijing, China, in 1989, 1992 and 1995, respectively. He was a postdoctoral fellow at Korea Advanced Institute of Science and Technology (KAIST) and later at Tokyo University of Agriculture and Technology from March 1996 to March 1999. From 1999 to 2004, he was a research staff member and later a senior researcher at the Central Research Laboratory, Hitachi, Ltd., Tokyo, Japan. His research interests include pattern recognition, image processing, neural networks, machine learning, and especially the applications to character recognition and document analysis. He has published over 200 technical papers at prestigious international journals and conferences. He won the IAPR/ICDAR Young Investigator Award of 2005. He is an associate editor-in-chief of Pattern Recognition Journal, an associate editor of Image and Vision and Computing, International Journal on Document Analysis and Recognition, and Cognitive Computation. He is a Fellow of the IAPR and the IEEE.

Topic: "*Deep Prototype Learning for Robust Pattern Recognition"*

***Abstract*—**Existing pattern classification studies mostly concern the generalized classification accuracy, but ignore the rejection and robustness in open world. In recent years, deep learning methods achieved huge successes in pattern recognition, but the popular deep neural networks show inferior generalization when training with small sample and poor robustness to noise and outlier. In the talk, I first explain the robustness of pattern recognition, and introduce some methods for improving the robustness from the viewpoint of rejection. The rejection methods fall in two categories: ambiguity rejection and outlier rejection, which are based on different models and learning methods. I will give the formulations of two rejection modes and introduce some methods. Last, I will introduce a newly proposed deep learning method for robust pattern classification: deep convolutional prototype learning (CPL). The CPL uses a

prototype classifier for classification, which is inherently robust to outlier. And combining with feature learning by convolutional neural network (CNN), the CPL yields high classification accuracy. Through regularization based on maximum likelihood (ML), the generalization performance on small sample and robustness can be further improved. The CPL model also shows potential in domain adaptation, online learning, novel class discovery, and so on.

Plenary Speaker Introduction

Plenary Speaker I

Prof. Linlin Shen
Shenzhen University, China

Prof. Linlin Shen is currently a professor at Computer Science and Software Engineering, Shenzhen University, Shenzhen, China. He is also a Honorary professor at School of Computer Science, University of Nottingham, UK. He serve as the director of Computer Vision Institute and China-UK joint research lab for visual information processing. He received the B.Sc. degree from Shanghai Jiaotong University, Shanghai, China, and the Ph.D. degree from the University of Nottingham, Nottingham, U.K. He was a Research Fellow with the University of Nottingham, working on MRI brain image processing. His research interests include deep learning, facial recognition, analysis/synthesis and medical image processing. Prof. Shen is listed as the Most Cited Chinese Researcher by Elsevier. He received the Most Cited Paper Award from the journal of Image and Vision Computing. His cell classification algorithms were the winners of the International Contest on Pattern Recognition Techniques for Indirect Immunofluorescence Images held by ICIP 2013 and ICPR 2016.

Topic: "*Deep Learning for Medical Image Analysis"*

***Abstract*—**In this talk, I will mainly introduce deep learning and its applications in medical image analysis. Our work using facial analysis for depression analysis will be introduced and followed by our recent work in applying deep neural network for pathology based autoimmune disease, gastric and breast cancer diagnosis. Patch based strategy will be elaborated to address the small sample problem. Finally, Lung nodule detection and ophthalmology will be introduced.

Invited Speaker Introduction

Invited Speaker I

Prof. Xi Xie
Sun Yat-Sen University, China

Prof. 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 Array-based Biomedical Devices for Drug Delivery Applications"*

***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.

Invited Speaker II

Dr. Junmei Zhong

Inspur USA Inc, USA

Dr. Junmei Zhong has been the Chief Data Scientist at Inspur USA Inc, Seattle, WA, USA since March 2017. He has both academic and industrial experiences with research interests ranging from data science, applied mathematics, machine learning, data mining, statistical analysis, NLP, text mining, digital advertising, information retrieval, knowledge graph, computer vision, pattern recognition, image processing, signal processing, to medical physics for CT and MR imaging. He was the Senior Principal Data Scientist at Spectrum Platform Company and Twelvefold Media Inc for content-based display advertising from 2015-2017. He was the Principal Data Scientist at Pitchbook Data Inc about NLP and graph theory from 2014 to 2015. He was the research faculty in University of Rochester, NY, and Assistant Professor in Cincinnati Children's Hospital Medical Center for improving CT imaging and MR imaging. He received his Ph.D. from EEE, The University of Hong Kong in 2000, M.S. about computer science from Nankai University and B.S. about computer science from Dalian University of Technology, China. In addition to many successful industrial projects, he has totally generated more than 20 publications in the prestigious journals and top conference proceedings with 3 patented technologies.

Topic: *"Edge-Preserving Image Denoising Based on Orthogonal Wavelet Transform and Level Sets*"

***Abstract*—**The level set approach has the potential to accomplish simultaneous noise reduction and edge preservation when it is used for image denoising. However, this kind of techniques is not very efficient for denoising very noisy images for their non-reliable edge-stopping criterion in the partial differential equation (PDE). In addition, the numerical calculation of curvature and other partial derivatives in the PDE is very sensitive to noise. In this paper, a new algorithm is developed to tackle such problems. Our idea is to first decompose the noisy image with the orthogonal wavelet transform (OWT) and then we only filter the noisy wavelet coefficients at the three finest scales without touching the wavelet coefficients at higher levels for reducing noise while preserving edge-related coefficients. The level-set based curve evolution is finally performed on the less-noisy image reconstructed from the denoised wavelet coefficients. Thus, the PDE model can be optimized by removing the Gaussian smoothing component. Furthermore, the numerical calculation of all partial derivatives in the PDE is influenced by less noise and the selective denoising becomes more

efficient. Experimental results show that the proposed algorithm outperforms the conventional level set methods and generates state-of-the-art denoising results in edge preservation and noise reduction.

Invited Speaker III

Prof. Alexander Suvoror

Institute of Experimental Medicine, St. Petersburg, Russia

Prof. Alexander Suvoror focus on the study of microbiological molecular biology, genetic and diversity of microbial communities, medicine for human rehabilitation, and the development of probiotics and some vaccine. The honors are listed below: President stipend for advanced scientists, Honorable diploma from the Scientific committee of Russian Duma, First prize of the Presidium of Russian Medical Academy for achievements in Medical science, Stipend for advanced scientists of Russia, one of the 100 best inventions of Russia, and so on. More than 180 papers and 7 monographs were published. 21 patents were granted. Prof. Alexander Suvoror also serves as the Director of the Department of Fundamental medicine and medical technologies of Saint-Petersburg State University, the Senior Researcher/General Manager of Russian Avena Technology Co.,Ltd., the chairman of the 18th International Conference on Intestinal Biology, the consultant on WHO streptococcal disease, the member of European Society for Clinical Microbiology and Infectious Diseases(ESCMI) and the Bureau of the International Society for Microbial Ecology(SOMED), and the director of the St. Petersburg Microbiology Society.

Topic: *"Microecological Aspects of Antibiotic Induced Dysbiosis and Autoprobiotics*"

***Abstract*—**Microecology is an important factor influencing the human health. Personified microbiota being established at the early age provides the metabolic and immunological balance of the organism. This natural balance can be broken under the influence of different factors including the usage of antibiotics. The major medical problem is how deep did the deformation of microbiota profile occurred in the organism and how to restore the original microbiological balance. We suggested that the usage of the indigenous bacteria for restoration of the natural microbiota conformation is a best way of returning microbiota back to normal. This approach called "autoprobiotics" is based on selection and growing of bacterial clones belonging to each individual and providing him his own bacteria grown outside of the body. This approach with the use of indigenous enterococci and lactobacilli was successfully tested in patients with gastrointestinal pathologies. In present study we analyzed different bacterial species or their combination selecting for the best autoprobiotics. Design of the study included, analyzing of microbiota of the animals (Wistar rats), selecting their

bacteria on the artificial growth media, feeding the rats with antibiotics for three days with the following treatment of the animals with different indigenous bacteria. It was determined that different species of autoprobiotics are providing a species characteristic changes in microbiota composition, however they were dramatically different from the metagenome after treatment with antibiotics. Specifics on the usage of different kinds of autoprobiotics tested are discussed.

Brief Schedule for Conference

<table>
<tr><td>Day 1</td><td colspan="2">June 23, 2018 (Saturday)
Venue: Lobby of Building A
Arrival Registration 10:00-16:00</td></tr>
<tr><td rowspan="9">Day 2</td><td colspan="2">June 24, 2018 (Sunday) 08:30-18:30</td></tr>
<tr><td colspan="2">Morning Conference (Building A)</td></tr>
<tr><td colspan="2">Venue: Room 509 (5 F)
08:30-08:40 Opening Remarks (Prof. Yuan-Ting Zhang)
08:40-09:25 Keynote Speech I (Prof. Yuan-Ting Zhang)
09:25-10:10 Keynote Speech II (Prof. Cheng-Lin Liu)
10:10-10:35 Coffee Break & Group Photo
10:35-11:20 Plenary Speech I (Prof. Linlin Shen)
11:20-11:40 Invited Speech I (Prof. Xi Xie)
11:40-12:00 Invited Speech II (Dr. Junmei Zhong)
12:00-12:20 Invited Speech III (Prof. Alexander Suvoror)</td></tr>
<tr><td colspan="2">Lunch: 12:20-13:50 Venue: (Xin Yuxuan Restaurant 莘语轩)</td></tr>
<tr><td colspan="2">Afternoon Conference (Building A)</td></tr>
<tr><td>Session 1: 13:50-16:20
Venue: Room 403 (4F)
Topic: “Image Processing and Information Technology”
10 presentations</td><td>Session 2: 13:50-15:50
Venue: Room 404 (4F)
Topic: “Molecular Biology and Pharmacological Analysis”
8 presentations</td></tr>
<tr><td colspan="2">Coffee Break: 16:10-16:30</td></tr>
<tr><td colspan="2">Session 3: 16:30-18:30
Venue: Room 404 (4F)
Topic: “Bioinformatics and Clinical Treatment”
8 presentations</td></tr>
<tr><td colspan="2">Poster Session: 08:30-18:30
Venue: Room 404 (4F)
13 Posters</td></tr>
<tr><td colspan="2">18:30~20:00 Dinner (Yu Pin Restaurant 御品私房菜)</td></tr>
<tr><td>Day 3</td><td colspan="2">09:00~17:00 Academic Visit and Tour</td></tr>
</table>

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

Detailed Schedule for Conference

June 23, 2018 (Saturday)

Venue: Lobby of Building A

10:00~16:00	**Arrival and Registration**

June 24, 2018 (Sunday)

Venue: Room 509 (5F), Building A

08:30-08:40		**Opening Remarks** Prof. Yuan-Ting Zhang City University of Hong Kong, Hong Kong
08:40-09:25		**Keynote Speech I** Prof. Yuan-Ting Zhang City University of Hong Kong, Hong Kong Topic: "*Cardiovascular Health Engineering: MINDS Design for Wearable and Flexible Sensing Systems*"
09:25-10:10		**Keynote Speech II** Prof. Cheng-Lin Liu Chinese Academy of Sciences, China Topic: "*Deep Prototype Learning for Robust Pattern Recognition*"
10:10-10:35		**Coffee Break & Group Photo**
10:35-11:20		**Plenary Speech I** Prof. Linlin Shen Shenzhen University, China Topic: "*Deep Learning for Medical Image Analysis"*
11:20-11:40		**Invited Speech I** Prof. Xi Xie Sun Yat-Sen University, China Topic: *"Nanoneedle Array-based Biomedical Devices for Drug Delivery Applications"*

11:40-12:00		**Invited Speech II** Dr. Junmei Zhong Inspur USA Inc, USA Topic: *"Edge-Preserving Image Denoising Based on Orthogonal Wavelet Transform and Level Sets"*
12:00-12:20		**Invited Speech III** Prof. Alexander Suvoror Institute of Experimental Medicine，St. Petersburg，Russia Topic: *"Microecological Aspects of Antibiotic Induced Dysbiosis and Autoprobiotics"*
12:20-13:50	**Lunch (Xin Yuxuan Restaurant 莘语轩)**	
	Afternoon Conference **Venue: 4th Floor, Building A**	
13:50-16:20	**Session 1, Room 403 (4F)** Topic: "Image Processing and Information Technology"	**Session 2, Room 404 (4F)** Topic: "Molecular Biology and Pharmacological Analysis"
16:10-16:30	**Coffee Break**	
16:30-18:30	**Session 3, Room 404 (4F)** Topic: "Bioinformatics and Clinical Treatment"	
8:30-18:30	**Poster Session, Room 404 (4F)** 13 Posters	
18:30-20:00	**Dinner (Yu Pin Restaurant 御品私房菜)**	

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 Presentation will be awarded at the end of each session on June 24, 2018.

Let's move to the session!

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, June 24, 2018 (Sunday)

Time: 13:50-16:20

Venue: Room 403 (4F), Building A

Session 1: Topic: "Image Processing and Information Technology"

Session Chair: Assoc. Prof. Liang Ming

R0005 Session 1 Presetation 1 (13:50-14:05)	Towards Protocol Security Testing of Transportation Control Systems in Real Networks **Liang Ming**, Gang Zhao, Xiaohui Kuang and Hu Li National Key Laboratory of Science and Technology on Information System Security, China *Abstract*—Transportation control systems are emerging intelligent applications nowadays. There are many users, controllers, actors, and operators involved in the transportation control systems. Each of these entities directly or indirectly change the way commodity is flowing. Interaction and cooperation among controllers, actors, and operators in transportation systems are now enabled by means of Center to Field (C2F), Center to Center (C2C) and Vehicle to Vehicle (V2V) communication. To ensure the goals of safer and more efficient transportation systems, testing and evaluation are required before deployment of transportation control systems. This paper provides a security model of transportation control system which integrates the classic network security and transportation requirement, and the threat source of transportation control system is also analyzed. Based on security model and threat source, this paper presents a protocol testing method for securing transportation control system applications based on message customization in real networks. A typical protocol test case on ONVIF (Open Network Video Interface Forum) camera in transportation control systems is also presented for the testing framework and method as well as to elaborate on potential use cases of it. Experiment result from the test case shows the protocol testing method in this paper can check the security of transportation control systems and find out their vulnerability. Challenges from combining the different application protocol tests into one framework, and limitations are also reported and discussed. Finally, the paper concludes with future development directions and applications of the testing method in transportation control systems.

R1009 Session 1 Presetation 2 (14:05-14:20)	Multiple Representations and Sparse Representation for Color Image Classification **Junqian Wang** and Yirui Liu Harbin Institute of Technology, China *Abstract*—Image representation is an important branch of machine vision. Appropriate representation is the premise and foundation to obtain good performance of image classification. Color characteristic is one of the important and readily available characteristics of image. However, the color has always been a controversial characteristic in the research of image processing and classification. Hence, in this paper, we present an effective multiple representation fusion method for color image classification to verify color information can improve the accuracy of image classification. Our method first employs three original color component images of RGB to generate the corresponding three kinds of new pixels images. The new pixels images and original color component images of the subject are complementary in the representing the subject, so we design a non-parameter weight fusion function for integration them to improve the accuracy of image classification. The experimental results on the AR, GT, IMM and COIL100 datasets prove that our proposed method outperforms than the gray image classification. This paper undoubtedly proves the significance of color component in image classification
R0009 Session 1 Presetation 3 (14:20-14:35)	Kappa based Weighted Multi-view Clustering with Feature Selection **Changming Zhu** Shanghai Maritime University, China *Abstract*—In recent years, multi-view clustering has been developed to a high level and widely used in many real-world applications. Since different views are variable representations of the same instance set, thus weighted multi-view clustering with feature selection (WMCFS) has been proposed to use information from multiple views simultaneously to boost the clustering results. WMCFS not only combines information from multiple views but also performs feature selection so as to solve high-dimensional data sets. Although related experiments validate the effectiveness of WMCFS, due to kappa is an index to measure the inter-rater agreement for qualitative (categorical) items, thus we introduce kappa to WMCFS and propose a kappa based WMCFS (KWMCFS) to boost the clustering performance further. Experiments on multi-view data sets Mfeat, Reuters, and Corel validate that compared with WMCFS, introducing kappa boosts the clustering and classification performances.
R0010	A Triangular Texture Mapping for 3D Modeling with Kinect **Feng Yang**, Jianxin Chen, Lujia Zhang, Jun Ge andJie Ding

Session 1 Presetation 4 (14:35-14:50)	Nanjing University of Posts and Telecommunications, China *Abstract*—3D modeling is a hot topic in the field of computer vision. With the appearance of the RGB-D camera, the 3D modeling becomes more convenient. However, during the modeling procedure, it will suffer from the error of pair-wise views registration, especially with the off-shelf sensor. In this paper we attempt to model the object in 3D space by using the Kinect sensor to scan the object on a rotating platform. To ensure the feasibility and modeling accuracy, we remove the non-overlapping points between adjacent frame cloud points during the pair-wise views registration, and propose a triangular UV mapping method to map the texture on the surface of object to the 3D model. Experimental results show that our solution could reconstruct the 3D model with high accuracy.
R0011 Session 1 Presetation 5 (14:50-15:05)	A Local Fingertips Movement and Fingertips Clustering Based Virtual Keyboard Adopting a Camera **Hui Ji**, Jianxin Chen, Yuqing Lin and Ang Li Nanjing University of Post and Telecommunications, China *Abstract*—With the development of virtual reality technology, human-computer interaction (HCI) changed from the traditional keyboard, mouse into many virtual methods. Different from the traditional virtual keyboard system recording and processing the all fingertips, our system pays attention to the keys been stroked, which means we only process the fingertip coordinates located in the key region. In addition, we also propose a fingertip extraction algorithm based on contour feature restriction and coordinate clustering. Compared to other virtual keyboard system, our system is simple but still effective. The extensive experiments demonstrate that our virtual keyboard system is flexible (only requires the camera in front of and above the keyboard to make sure the whole panel is detected by the camera), efficient (15 FPS on average, robust to cluttered backgrounds and placement between the camera and the paper keyboard, accurate (a 95.20% mean accuracy on 59 common used keys).
R0015 Session 1 Presetation 6 (15:05-15:20)	A Passive Heart Rate Measurement Method Using Camera **Kai Cai**, Jianxin Chen, Lujia Zhang, Qingyu Lin and Hui Ji Nanjing University of Post and Telecommunications, China *Abstract*—Heart rate is one of the most important Physiological characteristics related to the health. Recently, the non-contact heart rate measurement has got more attentions. However, these methods only focused on the active measurement. In this paper, we study the non-contact measurement of HR in a passive way which extends its further use into the smart home or e-health. In this system, a RGB

	camera is used to capture the video images about the objective. For these captured images, we strengthen the color from the captured images with an EVM algorithm, and use KCF algorithm to locate the chosen RoI. After that, the ICA algorithm is utilized to extract the effective signal, and the heart rate is obtained by an ideal band pass filter with the fast Fourier transform. Experimental results showed that our system can measure the heart rate effectively.
R4004 Session 1 Presetation 7 (15:20-15:35)	Comparative Analysis of Color Edge Detection for Image Segmentation **Mega Kusuma Wardhani**, Li Jinping and Xiangru Yu University of Jinan, China *Abstract*—Nowadays understanding of image processing and pattern recognition is the great focus to develop an application of image segmentation. Edge detection is the fundamental technique that can provide information of the boundaries in different objects in an image. Selecting a suitable edge detection algorithm is important to obtain the best performance of segmentation. This paper presents an analysis of implementation for various edge detection techniques on color spaces. We implement Sobel, Prewitt, Robert, and Laplacian edge detection on Hue, Saturation, Value (HSV) and YUV color space by using threshold = 65. We calculated the mean square error (MSE), root mean square error (RMSE), peak signal to noise ratio (PSNR) and execution time as a comparison. This paper tested images from Berkeley Segmentation Dataset (BSDS). The results showed that Robert edge detection in HSV color space especially hue channel can be utilized to obtain more precise boundaries in different objects and it is also quick to compute.
R1005 Session 1 Presetation 8 (15:35-15:50)	The Definition,Current Situation and Development Trend of Latent Aspect Rating Analysis in Text Mining **Shaohua Sun**, Kuisheng Wang and Tiantian Zhang Xi'an Shiyou University, China *Abstract*—The field of latent aspect rating analysis has been developed in the last few years.Firstly,we introduce the background and definition of latent aspect rating analysis in text mining.Secondly,we have collected literature on the latent aspect rating analysis of the research in recent years and summarized the development status of this field.Finally,the future development trend and expectation of this field are put forward according to relevant literature. Furthermore,the main contribution of this paper is to describe the field and analyze its development trend according to the author’s research work.
R1008 Session 1	Structure Extension of TAN Through Greedy Search **Runhua Li**, Guojing Zhong and Limin Wang Jilin University, China

Presetation 9 (15:50-16:05)	*Abstract*—Naive Bayes(NB) is well-known for its eective and relatively high accuracy for classication tasks. But its strong assumption that each attribute is independent diminishes its predictive accuracy. To weaken this assumption, some researchers proposed to allow limited number of interdependences between attributes. One of these attempts is Tree Augmented Naive Bayes(TAN), which is also the optimal 1-dependence classier in Bayesian Network Classiers(BNCs) for its excellent performance. But TAN can not be further promoted to 2-dependence if more interdependences between attributes are desired to be represented. Even the desired dependences have been found, adding it to the structure arbitrarily may cause the appearance of cycles if the direction is not correctly set. Those factors limited TAN's classication accuracy to much extent. We propose to apply greedy search algorithm on the conditional mutual information matrix generated by TAN to nd all the signicant dependences between attributes and then using a newly dened measure to set their direction. In this way, we can extend TAN to a higher dependence, name it kTAN, where k controls the number of allowed dependences of each attribute. Empirical studies showed that kTAN has signicantly advantage over TAN on classication accuracy with acceptable cost of complexity
R4001 Session 1 Presetation 10 (16:05-16:20)	Searchable Ciphertext-Policy Attribute-Based Encryption with Multi-Keywords for Secure Cloud Storage **Zhiyuan Zhao**, Zuohui Li, Lei Sun and Ying Liu Zhengzhou Information Science and Technology Institute, China *Abstract*—Searchable encryption is one of the most important techniques for the sensitive data outsourced to cloud server, and has been widely used in cloud storage which brings huge convenience and saves bandwidth and computing resources. A novel searchable cryptographic scheme is proposed by which data owner can control the search and use of the outsourced encrypted data according to its access control policy. The scheme is called searchable ciphertext-policy attribute-based encryption with multikeywords (CPABMKS). In the scheme, CP-ABE and keywords are combined together through the way that the keywords are regarded as the file attributes. To overcome the previous problems in cloud storage, access structures are hidden so that receivers cannot extract sensitive information from the ciphertext. At the same time, this scheme supports the multi-keywords search, and the data owner can outsource the encryption operations to the private cloud that can reduce the data owner' calculation. The security of this scheme is proved based on the DBDH assumption. Finally, scheme evaluation shows that the CPABMKS scheme is practical.

Session 2

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, June 24, 2018(Sunday)

Time: 13:50-15:50

Venue: Room 404 (4F), Building A

Session 2: Topic: "Molecular Biology and Pharmacological Analysis"

Session Chair: Prof. Tun-Wen Pai

S0020 Session 2 Presetation 1 (13:50-14:05)	Functional Simple Sequence Repeat (SSR) Biomarkers for Specific Gene Groups of *Oreochromis niloticus* Yang-Chun Chang, Cing-Han Yang, **Tun-Wen Pai**, Ronshan Chen and Rong-Hwa Chen National Taiwan Ocean University, Keelung, Taiwan *Abstract*—Selecting a superior strain of fish for cultivation, shortening the cultivation period, preventing environment deterioration, and reducing infectious disease transmission have become crucial factors for the aquaculture industry. Here we integrated bioinformatics and next-generation sequencing technologies to establish simple sequence repeat (SSR) marker selection database for Oreochromis niloticus (Nile tilapia). The designed system can facilitate fish farmers and biologists in effectively and efficiently performing marker-assisted selection. Genetic SSR biomarkers associated with the skeletal development system for Nile tilapias was experimentally verified in this study. In addition, a system for online comparison of two different Nile tilapia genomes was designed for the discovery of SSR variations. Based on Gene Ontology (GO) term features, a set of genes of interest and corresponding SSR biomarkers were retrieved and compared. Novel molecular biomarkers for a specific functional gene group can facilitate marker-assisted selection and breeding in the modern aquafarming industry.
S0008 Session 2 Presetation 2 (14:05-14:20)	Pathway Based Integrative Analysis for Gene and Protein Expression in Non-Human Primate Radiation Response **Chao Sima**, Shanaz A. Ghandhi, Younghyun Lee, Sally A. Amundson, Helen C. Turner, Michael L. Bittner and David J. Brenner Texas A&M Engineering Experiment Station, USA *Abstract*—A broad understanding and accurate detection of radiation

	response is critical to damage assessment and treatment in a large-scale radiological emergency. Non-Human Primate (NHP) has emerged as a preferred animal model to study radiation effects due to similarity to human health and physiology. In this study, we used a cohort of 8 NHPs (*Macaca mulatta*) and exposed them to a single uniform total body dose of 4 Gy of gamma rays from a Cobalt-60 irradiator, and collected whole blood samples pre- and up to 7 days post-irradiation, which were profiled for transcriptomic and proteomic responses. Thousands of proteins and genes were found to be significantly changed after irradiation, with partial overlap. In order to identify key biological processes involved in the radiation response, we linked proteins and genes using functional distances derived from multiple public databases including BioCarta, KEGG, NCI, Panther and HumanCyc. This pathway-based integrative approach generated a list of genes and proteins ranked by the collective response in their individual functional neighborhood supported by both datasets, providing a novel approach to selecting markers for further validation. Functional annotation of the top ranked proteins/genes revealed enrichment of key processes consistent with radiation response.
S0018 Session 2 Presetation 3 (14:20-14:35)	ToFiGAPS: an Online Bioinformatic Tool for Finding Genomic and Protein Sequences of Any Genomic or Protein Regions **Yaoyong Li** and Andrew D. Sharrocks University of Manchester, UK *Abstract*—We have recently created an online tool ToFiGAPS which performs the following four important bioinformatic tasks in a batch fashion: 1) find the genomic coordinates of a list of protein sections; 2) find the amino acid sequence of the proteins coded within a list of genomic regions; 3) find the DNA sequences of any genomic regions; and 4) find the amino acid sequences of any protein sections. As far as we are aware, there is no other publicly available software or online tool which can perform the task 1 or perform the task 2 in a batch fashion. The online tool ToFiGAPS was based on the R package geno2proteo which we created and which itself is available in the R repository CRAN. The online tool ToFiGAPS can be accessed via the link http://sharrocksresources.manchester.ac.uk/tofigaps/index.html. The web site currently works for human and mouse, the two most popular species in biomedical research area, but more species can be added if there is a need. We hope that this online tool will be useful for the bioinformatician in particular and the molecular biologists in general.
S0011 Session 2 Presetation 4 (14:35-14:50)	Proteomic Analysis of EGFR Specific Ligands in Pre-eclampsia **S. M. Vidanagamachchi** Department of Computer Science, Faculty of Science, University of Ruhuna, Sri Lanka *Abstract*—Pre-eclampsia is a common pregnancy complication and caused by both hypertension and proteinuria in pregnancy. Several patients have been reported with pre-eclampsia over the globe each year including Asian countries: Sri Lanka and India. Therefore, it is still required to reduce the rate of preterm birth of babies caused by

	pre-eclampsia. It has been reported that some of the genes from Epidermal Growth Factor (EGF) Receptor (EGFR) family are associated with pre-eclampsia. To this end, more studies have to be carried out to identify the protein interactions and disease associations in order to reduce the risk of pre-eclampsia. In this paper, a protein interaction network analysis and a disease enrichment analysis of pre-eclampsia were utilized in order to identify EGFR-specific ligands and other proteomics factors associated with pre-eclampsia. This analysis can provide insights into drug target identifications, identifying disease-related sub-networks, understanding disease pathogenic mechanisms etc. Rheumatic disease, hypersensitivity, obesity, arthritis etc. were seemed to be associated with pre-eclampsia. 143 proteins and 287 interactions were identified in protein interaction network of pre-eclampsia including all proteins of EGF family except Epigen. Results show that most of the ligands of EGF family and EGFR contribute to pre-eclampsia, which is associated with several other diseases.
S1004 Session 2 Presetation 5 (14:50-15:05)	Genetics of *LDLR* Gene in Pakistani Hypercholesterolemia Families **Akhtar Ali**, Ros Whittall, Masroor Ellahi Babar, Tanveer Hussain and Steve E. Humphries Virtual University of Pakistan, Lahore, Pakistan *Abstract*—Familial hypercholesterolemia (FH) is an autosomal dominant disorder caused by mutations in the three known genes. Low density lipoprotein receptor (LDLR) is considered as main contributor. We recruited clinically diagnosed 21 hypercholesterolemia families from Punjab-Pakistan. High resolution melting analysis used to screen the *LDLR* gene (all exons and promoter region) and variations were confirmed by restriction fragment length polymorphism and sequencing analysis. The mean of total cholesterol and LDL-cholesterol in the FH patients was 7.5±1.4mmol/l and 5.2±1.5mmol/l respectively. Seven patients showed synonymous variations in the sequence at position c.81T>C, c.993C>T, c.1413G>A, c.1617C>T, c.1725C>.T, c.1959T>C and c.2232A>G while one carried the non-synonymous change c.1171G>A resulting in the non-pathogenic p.(A391T) amino acid change. One common non-pathogenic variant c.1060+10C>G was found in the intronic region. In-silico analysis predicted c.1725C>T, c.1959T>C and c.2232A>G to be affecting the LDLR protein, by altering splicing sites as predicted by Human Splicing Finder and Mutation Taster software. Our findings suggest that ~15% (3/21) of FH patients in Pakistan with no detectable mis-sense mutation may carry pathogenic splicing variants in the *LDLR* gene sequence.
S3001 Session 2 Presetation 6 (15:05-15:20)	Multiscale Modeling & Simulation of Protein Adsorption on Surfaces **Zhifeng Kuang** UES, Inc., Dayton, OH, USA *Abstract*—Understanding the mechanisms of protein adsorption on solid surfaces is an essential step towards optimal design of biocompatible implanted materials and devices for medical applications, and antifouling

	materials for industrial applications. Using peptide adsorption on a gold surface as a model system, multiscale modeling and simulation approaches including quantum mechanical calculations, all-atom molecular dynamics simulations, and continuum methods, are employed to predict protein binding affinity, adsorption-induced structure change, and adsorption kinetics. First, the potential of mean force along the peptide-surface distance is calculated using the adaptive biasing force method. Second, the free energy of peptide adsorption is calculated by evaluating the ratio of the average probability density of the peptide in adsorbed to dissolved states. Third, the secondary structures of the adsorbed and dissolved peptide are calculated using the matrix method. Finally, the position-dependent diffusion coefficients are calculated by the forward-backward steered molecular dynamics simulation and used in solving the diffusion equation. Together, these computational techniques and results contribute important insights into the basic understanding of protein adsorption mechanisms on abiotic surfaces.
S1002 Session 2 Presetation 7 (15:20-15:35)	Lipid-lowering Property of Flavonoid-rich Portion of *Combretum micranthum* on High Fat Diet Induced Hyperlipidemic Rats **Abba Babandi**, Najibullah Danjuma Musa, Murtala Ya'u, Hafeez Muhammad Yakasai, Dayyabu Shehu, Kamaludden Babagana and Aminu Ibrahim Bayero University Kano, Nigeria *Abstract*—This study evaluates the lipid-lowering potential of flavonoid-rich portion of *Combretum micranthum* (CM) in a high-fat diet induced hyperlipidaemic albino Wistar rats. The experimental rats were fed on a High Fat Diet (HFD) for three weeks and those found to be significantly hyperlipidemic were subdivided into five groups with the one control group. Group I (Normal control) received only normal feed and water, while group II were fed on HFD and water throughout the experiment. Group III, IV and V received aqueous methanol leaf extract of CM (flavonoid) at varied doses of 100, 200 and 400 mg/kg, respectively, while group VI were given the standard drug- Atorvastatin (4 mg/kg) for two weeks. The dried powdered leaves of CM were extracted with 80% aqueous methanol and dried to a constant weight. Characterization and identification of flavonoid extract was conducted using Gas Chromatography Mass Spectrometry (GC-MS) and FTIR spectroscopy. Total Cholesterol (TC), Triacylglycerol (TAG), High Density Lipoproteins (HDL-C), Creatine Kinase (CK), and Lactate Dehydrogenase (LDH) were assayed for, using spectrophotometric method. Weight, Low Density Lipoproteins {LDL-C) and Athrogenic Index (AI) were calculated using standard formulae. Fourteen (14) Functional groups were identified in the FTIR spectroscopy with the

	principal ones being phenols and alcohols. Twelve (12) compounds were identified in the GC-MS of flavonoid extract, the principal of which happened to be 2,3-dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one, 5-oxycatechol and 1,2,3- benzene- triol. Significant decrease in weight was found in the rats given 400mg/kg dose compared to hyperlipidemic control ($p<0.05$). Significant reduction in TC, TAG, LDL-C, AI, CK and LDH were observed compared to hyperlipidemic control ($p<0.05$). HDL-C was found to be significantly increased ($p<0.05$) compared to hyperlipidemic control. Thus, from the result of this study, flavonoid extract of CM exhibited weight loss and lipid-lowering properties and hence can be useful in the management of cardiovascular diseases
S1003 Session 2 Presetation 8 (15:35-15:50)	2, 3, 4, 5 – Tetrahydroxy – Cyclohexane Ester Glucoside Isolated from *Combretum micranthum* Methanol Extract Is a Potent Anti-diabetic **Aminu Ibrahim**, Onyike E., Nok A. J., Muhammad A. and Umar I. A. Bayero University, Kano, Nigeria *Abstract—Combretum micranthum*, Fam. (G éézà in Hausa) (Combretaceae)) are used traditionally for the management of diabetes mellitus (DM) in the North-Eastern part of Nigeria with little or no scientific basis. It is thus the aim of this research to validate the anti-diabetic potential of *C. micranthum* (CM) leaf extracts. In vitro α-amylase and α-glucosidase inhibitory activities and in vivo fasting blood glucose concentrations (for determining hypoglycaemic activity) in mice were determined following series of fractionations using column and thin layer chromatographic analyses. The hypoglycaemic activity may be associated with a polar cyclohexane glucoside compound, identified by 1H and 13C NMR, which acts via inhibition of α-amylase and α-glucosidase activities. Molsoft ICM-pro 3.8-3 was used to carry out docking analysis which further supports inhibitory activities of the glucoside compound against the two carbohydrate hydrolysing enzymes. In conclusion, 2,3,4,5 – Tetrahydroxy – Cyclohexane Ester Glucoside isolated from *C. micranthum* methanol leaf extract showed significant ($P < 0.05$) hypoglycaemic activities in alloxan-diabetic mice.

16:10-16:30	**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, June 24, 2018 (Sunday)

Time: 16:30-18:30

Venue: Room 404 (4F), Building A

Session 3: Topic: "Bioinformatics and Clinical Treatment"

Session Chair: Assoc. Prof. Lei Wang

S0010 Session 3 Presetation 1 (16:30-16:45)	Wavelet Transform Based ECG Denoising Using Adaptive Thresholding **Lei Wang**, Wei Sun, Yibo Chen, Peng Li and Lingxiao Zhao Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China *Abstract*—Electrocardiogram (ECG) is a widely employed tool for the analysis of cardiac disorders and clean ECG is often desired for proper treatment of cardiac ailments. In the real scenario, ECG signals are usually corrupted with various noises during acquisition and transmission. As an important branch of wavelet transform, multiresolution has achieved good results in the noise reduction processing in many fields, such as ECG signal, voice signal, image signal and so on. However, multiresolution has strong dependence on the selection of wavelet threshold and wavelet function. In this paper, an adaptive wavelet threshold calculation and selection method is proposed. Based on the heuristic threshold optimization method, the adjustment factor of wavelet decomposition layer number and level influence is incorporated into the method. By dynamically adjusting the threshold calculation function for wavelet coefficients of each layer, more reasonable signal decomposition and noise reduction could be realized. The experimental results show that the proposed algorithm could achieve better performance in reducing the noise of ECG and could meet the needs of clinical application.
S0004 Session 3 Presetation 2	In Silico Design of High Redox Potential Laccase for Industrial Applications **Poh Nee Teo** and Saharuddin Bin Mohamad Multimedia University Malaysia & University of Malaya, Malaysia

(16:45-17:00)	*Abstract*—Laccases are multicopper oxidoreductases which are widely used in industrial applications such as in bioremediation, organic sythesis, textiles, pulp bleaching, biosensor, due to their broad substrate specificity. Laccases used in industry field are mostly from *basidiomycete* family(white-rot fungi) with high redox potential, +0.7/0.8V at the T1 copper site. However, the laccases may far from optimal under operation for industrial application conditions. This may lead to operation costs increasing in order to provide high catalytic activity and stability. To reach such of these industrial demands, specific features of bacterial laccases which normally have low redox potential have been adapted in order to design high redox pontential laccases in conjuction with reduced production cost. In this study, we examine the significant regions or residues among high -, medium- and low redox pontential laccases(mainly from bacteria) that can be employed to convert laccases from low redox pontential into high redox pontential by Evolutionary Trace Analysis method (ETA). At T1 active site, *Leu495,Glu498,Met502,and Met503* were identified as potential residues for redox potential manipulation. Active site of low-redox potential laccase was modified by in silico mutation and its structure after mutated is in about similar to high-redox potential laccase.
S0005 Session 3 Presetation 3 (17:00-17:15)	The Modeling Analysis on Porous Media Hepatic Cancer for Microwave Ablation of an Interstitial Helix-antenna **Montree Chaichanyut** King Mongkut's Institute of Technology Ladkrabang, Thailand *Abstract*—Microwave ablation is processed, which uses the electromagnetic transform into heat to destruction or kill cancer cells. This study presents analyses of 2.45GHz Helix-antenna configuration and design for porous hepatic cancer microwave ablation by using 3D-finite-element model. The configurations of Helix-antenna were considered: Tipped tip helix antenna (THA) and Extension tip helix antenna (EHA). 3D finite-element models were utilized to investigate the tissue temperature distribution during and after microwave ablation. The study aims to understand the influences of antenna type on the specific absorption rates (SAR) along the helix-antenna insertion depths and the ablation zone (heating profile and lesion volume) inside the hepatic cancer porous models with 5 cm-in-diameter tumor. All scenarios were the initial power was set at 50 W and simulated under temperature-controlled mode (90℃). Based on the preliminary results, the result illustrates that the THA occur the SAR and heating profile at the lateral around of the antenna, while the SAR and heating trend of EHA occur skew toward of the tip antenna. Both antennas destroy unwanted tissue, but the THA use longer duration than EHA for ablating unwanted tissue. The duration of ablation was 700s, respectively, the

	coagulation volume of THA and EHA were 95.45 and 104.27 cm^3.
S0023 Session 3 Presetation 4 (17:15-17:30)	Linear and Non-linear Classifiers for Clinical Risk Factor Analysis of Cancer Patients **Sugandima Vidanagamachchi** and Thamara Waidyarathna University of Ruhuna, Sri Lanka *Abstract*—Cancer is a common disease condition, which is growing rapidly in the modern society. Different features such as tumor size, age, number of genomic alterations and non-synonymous mutations etc. have been considered in diagnosing and treating cancer patients. Linear and non-linear models can be utilized in analyzing the risk factors of cancer patients. Regression analysis is one particular machine learning technique, which could be perfectly utilized to identify and characterize relationships between multiple risk factors of cancer. As the insights of relationships among the clinical risk factors of patients can be useful in diagnosis and treatments of cancer, our main objective is to identify the relationships among their clinical risk factors using simple and multiple regression analysis as the machine learning techniques and find the appropriateness of the results with the previous experimentally proved results. A significant (p-value <0.05) relationship could be observed among the overall survival months and the age of merged cohort of Lower Grade Glioma and Glioblastoma brain tumor patients. Further, the relationship between the percent aneuploidy and the age of these brain cancer patients is observed as significant. Moreover, a significant relationship can be seen between the overall survival months and the age of Acute Myeloid Leukemia patients. Further, we analyzed the brain cancer data set using regression trees as it can provide a solution model using overall survival months and percent aneuploidy over age.
S1008 Session 3 Presetation 5 (17:30-17:45)	Mathematical Modeling of Ascites Formation in Liver Diseases **Natbordi Meedejpraserth** and Kritsada Leungchavaphongse Chulalongkorn University, Thailand *Abstract*—Ascites is one of the most common symptoms occurred in patients with some liver diseases such as cirrhosis and alcoholic hepatitis. This paper presents a mathematical model of the ascitic fluid formation accumulated from blood and insterstitial fluid circulations within the liver with pathology. The liver lobules are treated as porous media in hexagonal shapes connected as a lattice where the flux of ascitic fluid is measured at its border. The influence of size of sinusoids, interstitial space, and fenestrated wall on ascites volume is investigated. Sinusoidal obstruction has the most effect on ascites production compared to the others. Moreover, since each liver disease has different character of pore obstruction, we investigated the effect of location of sinusoidal obstruction on ascites production. The generalized occlusion

	has more effect on ascites than pericentral and periportal occlusion, respectively, which is correlated to clinical findings in each hepatic disease. The flux of ascitic fluid is related linearly to hepatic wedge pressure (P_w) and free hepatic pressure (P_f). From these results we conclude that increasing of either P_w or P_f can increase production of ascitic fluid.
S1006 Session 3 Presetation 6 (17:45-18:00)	Computational Drug Repositioning for Psychiatric Disorders **Hon-Cheong So**, Carlos K. L. Chau, Wan-To Chiu, Kin-Sang Ho, Cho-Pong Lo, Alexandria LAU, Sze-Yung WONG, Stephanie Ho-Yue Yim and Pak C. Sham The Chinese University of Hong Kong, China *Abstract*—The time and cost for novel drug discovery is ever-increasing. Drug repositioning, i.e. using existing drugs for new therapeutic indications, represents a cost-effective approach to speed up drug development. With increased availability of large-scale "omics" data, computational methods will play an important role for prioritizing candidates suitable for repositioning. Here we will present an approach for repositioning by comparing imputed expression profiles from genome-wide association data and drug transcriptomes. We also propose another method based on the principles of gene-set analysis. We focus our applications on psychiatric disorders since few repositioning studies were targeted towards these disorders. We found that the above methods successfully "re-discovered" known drugs for the studied diseases and revealed novel repositioning candidates that are supported by the literature.
S0014 Session 3 Presetation 7 (18:00-18:15)	Texture Segmentation of Urinary Sediment Image Based on a Weighted Gaussian Mixture Model with Markov Random Fields Xiaoming Jiang, **Fuqu Chen**, Qianqian Chen, Miaomiao Si and Wei Wang Chongqing University of Posts and Telecommunication, China *Abstract*—In clinical laboratory studies, it is of importance for urinary sediment images because the composition and quantity of specific cells contained in the images revealing information for the diagnosis of urinary and renal diseases in humans. In this paper, we propose a method for the segmentation of urine sediment image using the magnification of 20-fold microscopy based on Markov model. This method selects sum average feature derived from the spatial gray co-occurrence matrix for the classification in the neighborhood window with the size of 7×7. First, each pixel in the image is evaluated by its intensity dispersion in comparison with the average intensity of the 7×7 neighborhood, and the pixels with higher dispersion would be further proceeded by Gaussian mixture model. Here the weights is designed feature distance matrix

	within the window to obtain similar, so as to re-estimate the features. Edge positioning is more accurate and clear compared with the traditional morphological methods by using the method of texture segmentation about urinary sediment image in this paper which can make it avoids cell adhesion caused by too closer proximity of cells and there is no glitch in the target area.
S0025 Session 3 Presetation 8 (18:15-18:30)	Time-Frequency-Space Range of EEG Selected by NMI for BCIs **Li Wang**, Chun Zhang and Xiao Hu Guangzhou University, China *Abstract*—In order to increase the classification accuracy of the mental tasks with speech imagery, a time-frequency-space range selection model based on neighborhood mutual information (NMI) is proposed. According to time, the electroencephalography (EEG) signals are divided into 7 distinct segments. These 7 sections of signals are filtered by 28 band pass filters with different frequency range. The filtered signals are extracted by common spatial pattern (CSP) to obtain spatial matrices. Then, the NMI values of these matrices are calculated. At last, the time-frequency-space range is optimized by NMI values. The EEG signals are processed by the selected time-frequency-space range, and the eigenvalues are calculated and classified by variance and support vector machines, respectively. From the results of 10 subjects, the average classification accuracy is improved by 3.0% after optimization. The improvements of subjects S2 and S5 are the most pronounced, and their results are increased by 5.0% and 5.2%, respectively. With automatic range selection and improvement of classification results, the model is entirely applicable to real time optimization calculation of online brain-computer interfaces.

Poster Session

June 24, 2018 (Sunday)

Time: 08:30~18:30

Venue: Room 404 (4F), Building A

R1006 Poster 1	Augmented Reality Travel App Based on Image Retrieval Algorithm **Yafang Zhou**, Yun Tie, and Lin Qi Zhengzhou University, China *Abstract*—In recent years, AR technology has attracted the attention of many researchers or groups, and has been applied in many ways, such as game, teaching, military, medicine and so on, bringing new life experience to people. But in the tourist attractions traveler may encounter such problem. As the traditional travel software cannot provide the real-time introduction of the tourist attractions for the users, we proposed a novel travel app based on AR to solve this problem. It can retrieve similar picture from the data sets according to the pictures taken by travelers, then show the relevant introduction of tourist attractions. Travelers can also choose to scan the photos on the tour book, and achieve the same effect. In order to retrieve the similar image quickly and accurately, this paper uses the Vector Of Locally Aggregated Descriptors (VLAD) combining the cosine distance to retrieve images. The experimental results show that the method meets the demands of real-time and accuracy in a large number of image retrieval.
R3001 Poster 2	Facial Expression Recognition Based on Multiple Feature Fusion in Video **Jiahui Fan** and Yun Tie Zhengzhou University, China. *Abstract*—Facial expression recognition in video has attracted growing attention recently. In this paper, we propose a new framework for emotion recognition with multiple feature fusion in video. Firstly, the preprocessing of the video database adopts the coarse-to-fine auto-encoder networks (CFAN) to realize the gradual optimization and alignment of the facial expression image. Secondly, in the feature extraction part, two sets of global features the convolutional neural network (CNN) and the Gist are extracted from video clips. The local binary patterns (LBP) and the local phase quantisation from three orthogonal planes (LPQ-TOP) are extracted from the local facial image.

	Then discriminative multiple canonical correlation analysis (DMCCA) is used to fuse the two groups of global and local features. We use the kernel entropy component analysis (KECA) algorithm to reduce the dimension of features. Finally, support vector machine (SVM) is used to classify facial expression. Experiments on RML and SAVEE facial expression video database show that feature fusion can effectively improve expression recognition accuracy.
R0006 Poster 3	Image Segmentation Based on Entropy of Interval Type-2 Fuzzy Sets **Lan Yao**, Hanbing Yan and Zefeng Wei Chengdu University of Information Technology, China *Abstract*—Fuzzy entropy-based method is an effective way for image segmentation. In this paper, a segmentation method based on an interval type-2 fuzzy entropy is presented. Firstly, we propose a method to construct entropy of interval type-2 fuzzy sets which serves as an objective quality measure to compare the image. Then, within the framework of fuzzy approaches to image thresholding, the membership function of interval type-2 fuzzy set associated with image is generated and the pixel-based fuzzy entropy is defined using the proposed method. Finally, a thresholding selection method is developed to search for the optimal threshold in the image segmentation. The experimental results demonstrate the effectiveness of the proposed method. Quantitative evaluations over a variety of images show that the proposed method is comparable to several state-of-the-art methods.
R0018 Poster 4	A RBAC-Based Multitask Spatio-Temporal Access Control Model MT_RBAC **Ying Zhang**, Xu Zhen and Chen Chi University of Chinese Academy of Sciences, Beijing, China ***Abstract*—**Under the multitask environment, on the one hand, the demand for spatio-temporal correlation of access control models continues to increase, on the other hand, multitask simultaneous authorization causes resource competition in the task execution phase, which may leads to the failure of task execution due to lack of some resouces. This paper proposes a spatio-temporal access control model MT_RBAC for resolution of above two problems. By precisely defining the spatio-temporal model and constraint conditions, the spatio-temporal correlation of the existing access control model is enhanced. The task-centric authorization mechanism is defined to introduce the resource control to access control authorization phase, and solve the problem of that the task execution failed halfway. This paper formally defined the space-time model and MT_RBAC model.

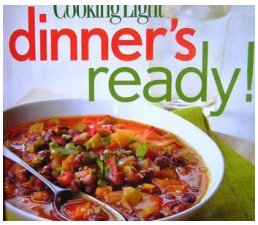
R0017 Poster 5	An Improved AFF Algorithm for Continuous Monitoring for Changepoints in Data Streams **Junlong Zhao**, Mengying An, Lv Xiaoling, YiWei Fan and Menghang Liu Beijing Normal University, China *Abstract*—Changepoints detection of online data streams is a very important issue. Adaptive estimation using a forgetting factor (briefly AFF) is an efficient algorithm for this problem. However, AFF assumes the pre-change distribution is normal, which is restrictive. In addition, AFF uses a defaulted step size 0.01. In fact, numerical results show that the step size has significant impact on the final performance of AFF algorithm, and a principle is lacking on choosing the step size. In this paper, we develop an improved AFF algorithm (briefly, IAFF). Specifically, a distribution free measure for declaring changepoints is proposed, which makes IAFF algorithm performing well for different pre-change distributions. Moreover, a general principle on choosing the step size is proposed based on intensive numerical study. Simulation results show that IAFF algorithm has much better performance than AFF in different situations.
R4005 Poster 6	Guidance Law Simulation for Strap-down Laser Seeker **Si-zhi Yang** Northwestern Polytechnical University, China *Abstract*—For small caliber ammunition is limited by its space and cost ， a full strap-down laser seeker was proposed to implement a proportional guidance law. By studying the working principle of the laser detector, the physical model of the detector was modeled by mathematical method. The LOS (line of sight) angle and the rate of the LOS angle was obtained by using the cosine theorem and vector operation, the digital stability platform of the detector was established. Under the coordinate of the detector after compensation, the measurement model of the detector was established, and the proportional guidance control is carried out. The simulation of a 12.7mm guidance bullet is used to verify that the guidance system can meet the requirements.
S0001 Poster 7	The Quick Prediction of Carbohydrate in Different Kinds of Fruit Base on NIR Spectrometer **Yan Yang** and Yu Wang Guangxi Teacher Education University, China *Abstract*—The fruit is very popular with people because it is full of sugar, sour, vitamin and mineral substance, etc. However, for diabetics, it is no recommended to take in superfluous fruits, they must control blood

	glucose strictly. So, it is important to evaluate the carbohydrate in food for them to avoid occurrence of various diabetic complications caused by hyperglycemia as far as possible. In this paper, we proposed an innovative carbohydrate measurement method, which could quickly and easily evaluate the carbohydrate in various fruit, such as apple、pear、peach and mango. We obtained the reflecting spectrums of samples (900nm-1700nm) and then built carbohydrate prediction model with different algorithms. The result showed that it is feasible to build a general carbohydrate prediction model for different fruits. The preliminary results showed the good performance of model: RC=0.72 in calibration set and RP =0.62 in prediction set.
S0003 Poster 8	The Comprehensive Assessment of the Normalization Methods Applied to Metabolomics Data **Shuang Li**, Xuejiao Cui and Feng Zhu Chongqing University, China *Abstract*—The major bottlenecks of metabolomics are data pre-processing and analysis. Normalization is usually utilized to remove the different types of unwanted systematic variations in high-throughput mass spectrometry-based metabolomics data. Many recent researches compared or evaluated normalization methods used in metabolomics almost based on only one single criterion, such as the normalization method's effect on classification. However, the performances of normalization methods varied wildly and relied on the natural of dataset. In this study, we evaluated systematically existing 12 sample-wise normalization methods from multiple perspectives. By applying multi-criteria, including method's capability of maximal variation between the inter-groups, method's effect on the differentially metabolic features and method's effect on the performance of classification, VSN normalization method performed almost consistently better than other methods. From our investigation, we suggested that researchers should take multiple criteria into consideration when selecting proper normalization methods to ensure the reliability of downstream analysis and experimental validation.
S0009 Poster 9	Application of Ultrasound-guided Puncture and Drainage Combined with Different Sclerosing Agents in the Treatment of Simple Galactoma Dan Fei, Yang Li and **Guo qing Sui** Department of Ultrasound, China-Japan Union Hospital of Jilin University, China *Abstract*—Objective: to investigate the clinical effect of ultrasound-guided drainage combined with different sclerosing agents in treating simple galactoma, and to provide reference for the treatment of patients with simple galactoma.Methods: The clinical data from 120

	cases of patients with simple galactoma were analyzed retrospectively. As for group A,40 cases having undergone ultrasound-guided drainage were injected with Lauromacrogol, and 40 cases were injected with anhydrous ethanol after ultrasound-guided drainage(group B),40 cases underwent ultrasound-guided drainage (control group).The clinical effect and the adverse reactions were compared among the three groups. Results: The total effective rate of group A, group B and control group were 95.24%, 97.50% and 82.86%, respectively. There was no statistical difference in the total effective rate between group A and group B (P>0.05), but the total effective rate of group A and B were higher than that of control group (P<0.05), with statistical significance（P<0.05）.The adverse reactions in group B were more than those in group A and control group (P < 0.05),with statistical significance （ P<0.05 ） . Conclusion: the injection of Lauromacrogol as well as anhydrous ethanol after Ultrasound-guided drainage is less invasive with exact effect in the treatment of simple galactoma.
S0012 Poster 10	Influence of the Number of Chondrocytes in Lacunae on Micromechanical Behaviors in Cartilage Defect Repair Area under Cyclic Compression **Xige Ma** and Haiying Liu Tianjin University of Technology, China *Abstract*—COMSOL finite element software was used to establish a solid-liquid coupling biphasic model of articular cartilage and microscopic models of chondrocytes. The micromechanical behaviors of chondrocytes were studied under cyclic loading at different frequencies. The results showed that the number of chondrocytes in the deep layer cartilage lacunae affected the micromechanical behaviors of chondrocytes, the maximum stress of chondrocytes (3 chondrocytes in the same lacunae) were larger than those of chondrocytes (2 chondrocytes in the same lacunae). After repair defect, the maximum stress of chondrocytes under low frequency loading (0.1Hz) was higher than those of chondrocytes under high frequency loading (0.5Hz). The Mises stress of pericellular matrix (PCM) in intact cartilage was 4.7-6.4 times that of chondrocytes. The study of the micromechanical behaviors of chondrocytes by finite element numerical simulation will has a certain guiding significance for the study of the mechanism of biomechanics on chondrocytes.
S0013 Poster 11	Energy-aware Multi-objective Placement of Virtual Machines in Cloud Data Centers **Hanan Al-Shehri** and Khaoula Hamdi King Saud University, Riyadh, Saudi Arabia *Abstract*—Cloud computing is a model for enabling convenient,

	on-demand access to a shared pool of configurable computing resources. The main advantage of cloud computing is minimizing the cost, but on the other hand energy consumption in cloud data centers is exponentially increasing. Thus, there is a need to improve the energy efficiency of cloud data centers. In this paper, the optimization of the virtual machines placement is considered with the objective of improving the energy efficiency. An Ant Colony Algorithm is proposed with multiple objectives. In addition to minimizing the energy consumption by reducing the number of active physical machines, the generated network traffic is minimized and the utilization of the resources is maximized. CloudSim tool is then used to simulate the results of the proposed algorithm.
S0022 Poster 12	Automatic Image Segmentation of Breast Thermograms **Mai Adel**, Bassant Abdelhamid and Salwa El-Ramly Higher Institute of Engineering and Technology, Egypt *Abstract*—Breast cancer has a great attention worldwide due to the increase of the number of patients, especially women, suffering from this disease. However, breast cancer can be cured if it is detected in its early stages. Breast thermography is a promising screening technique for the early detection of breast cancer. In this paper, an automatic segmentation algorithm for frontal breast thermograms is proposed. The proposed algorithm performance is evaluated using two different databases. The proposed algorithm proves its ability to successfully segment all types of breasts (small, medium, large, asymmetric and flat). Moreover, quantitative measures are computed to verify the capability of the proposed algorithm.
S1005 Poster 13	A Survey on Indigenous Knowledge Systems Databases for African Traditional Medicines **Catherine Francis Mangare** and Jie Li Harbin Institute of Technology, China *Abstract*—This study aimed at surveying the constructed Indigenous knowledge systems databases for African Traditional medicine; learning their diversity features, common challenges and develops the missing information when constructing indigenous knowledge system for Tanzanian Traditional Medicine. According to the research presented by different scholars, there are more than 10 databases for African traditional plants medicine. The translation of biodiversity towards the new therapy has been a challenge towards creating the database for traditional medicine in Africa. This has led to most of the available database lack enough information on ethnopharmacological data. The effort towards the introduction of bioinformatics in most of the undergraduate circular gives the best direction towards developments of

	computational in pharmaceutical fields. By concluding, the development of global data in a single indigenous knowledge system may be impossible in view of the culture and biodiversity differences; efforts have to be given to specific regional areas and African museum should act as a center to link all indigenous knowledge systems. The need of using the collaborative approach for defining a common standard in medicinal plant database for knowledge sharing and scientific advancement is inevitable in developing a unified indigenous knowledge systems Database for African Traditional Medicine.



Dinner	
18:30-20:00	**Restaurant**

Listener List

L 1	Feng Cui	Rochester Institute of Technology, USA
L 2	Gongxin Peng	Institute of Basic Medical Sciences, Chinese Academy of Medical Sciences and Peking Union Medical College, China
L 3	Yibo Chen	Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China
L 4	Lingxiao Zhao	Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China
L 5	Qianqian Chen	Chongqing University of Posts and Telecommunication, China
L 6	Danyang Guo	Institute of Agro-Food Science and Technology, Shandong Acedemy of Agricultural Sciences, China
L 7	Shuangzhi Zhao	Institute of Agro-Food Science and Technology, Shandong Acedemy of Agricultural Sciences, China
L 8	Yaoguang Jin	Novo Nordisk Research Center China, China
L 9	Qiulei Zhang	Novo Nordisk Research Center China, China
L 10	Yingzi Huang	Novo Nordisk Research Center China, China
L 11	Xinyu Zhao	Novo Nordisk Research Center China, China

Conference Venue

Harbin Institute of Technology, Shenzhen, China

http://www.hitsz.edu.cn/

Addr.: Building A, HIT Campus of University Town of Shenzhen, Shenzhen, China(深圳市南山区西丽大学城哈尔滨工业大学，深圳校区 A 栋)

Founded in 1920, Harbin Institute of Technology (HIT) has remained on the top 10 list of the Best Universities in China. HIT enjoys the fame as the leading engineering school in China. In 2002, HIT and the Shenzhen Municipal Government created HIT Shenzhen Graduate School in the University Town of Shenzhen. Together with Graduate Schools of Tsinghua and Peking University, HITSZ is an indispensable part of the Shenzhen-Hong Kong research and innovation base. HIT, Shenzhen strives to maintain the academic excellence of HIT and is dedicated to top quality, innovation and internationalization.

Map


过桥去清华
去北大、图书馆
学苑大道
学苑大道
学苑大道
哈尔滨工业大学
深圳研究生院-E座
哈尔滨工业大学
深圳研究生院-F座
哈尔滨工业大学
深圳研究生院-C座
大学城社区
服务室
哈尔滨工业大学
深圳研究生院-B座
哈尔滨工业大学
深圳研究生院-A座
Graduate School, Building A
哈尔滨工业大学
(深圳)
哈尔滨工业大学
深圳研究生院-G座
圣诺轩
哈尔滨工业大学
深圳研究生院
维也纳酒店
(大学城店)
Vienna Hotel
学校入口/University Entrance
全时世家

Academic Visit & Tour

June 25, 2018 (Monday) 9:30~17:30

(Tips: Please arrive at the Harbin Institute of Technology, Shenzhen, China before 9:20 a.m. The following places are for references, and the final schedule should be adjusted to the actual notice. Tickets are on own expense)

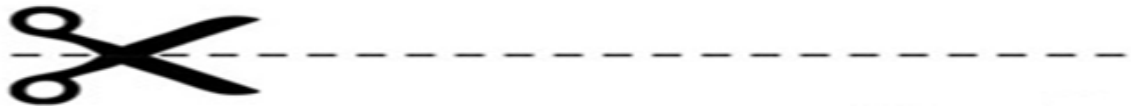
人体智能感知实验室参观项目 （Human IntelliSense Lab Visit Project）	
Time	Specific Arrangement
9:30-10:30	人体智能感知穿戴设备体验 （Human IntelliSense Wearable Device Experience） 脑电（EEEG），眼动仪（Eye Tracker） 动作捕捉（Motion Capture），智能手环（Smart Bracelet）
10:30-11:30	沉浸式虚拟现实体验（Immersive Virtual Reality Experience）——CAVE
	AR 体验（AR Experience）——Brain Lable Viewer
	MR 体验（MR Experience）——HoLonlens
12:00~13:00	午餐（Have a lunch）
14:00~14:30	地王大厦（Diwang Mansion）
15:30~16:00	海滨栈道（Yantian Seaside Boardwalk）
17:00~17:30	大梅沙海滨公园（Dameisha Beach Park）
17:30	回哈工大（Go back to HIT）



Note

Note

Note



Feedback Information

(Please fill this form and return it to conference specialist during the conference days.)

Personal Information	
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E-mail Address	
Area of Research	
Affiliation	

Please indicate your overall satisfaction with this conference with "√"

	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
Conference Content					
Presentation and Paper Value					
Registration Process					
Venue					
Food and Beverage					

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Would you please specify the main reason for attending this conference?	
Did the conference fulfill your reason for attending?	Yes– Absolutely □ Yes- But not to my full extent □ No□ (If "No", please tell us the main reason)

Would you please list the top 3 to 5 universities in your city?	
Other Field of Interest	
Any Other Suggestions/Comments	

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!