

2018 CBEES-BBS TIANJIN, CHINA CONFERENCE ABSTRACT

**2018 International Conference on Electronics and
Electrical Engineering Technology (EEET 2018)**

September 19-21, 2018

Tianjin Polytechnic University, Tianjin, China



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Introduction

Welcome to 2018 International Conference on Electronics and Electrical Engineering Technology (EEET 2018) which is sponsored by Hong Kong Chemical, Biological & Environmental Engineering Society (CBEES), Biology and Bioinformatics (BBS) and co-sponsored by Tianjin Polytechnic University, Tianjin, China. The objective of 2018 International Conference on Electronics and Electrical Engineering Technology (EEET 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 Electronics and Electrical Engineering Technology.

Papers will be published in the following conference proceedings:



International Conference Proceedings by ACM (ISBN: 978-1-4503-6541-3), 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).

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

Presentation Instruction

Instruction for Oral Presentation

Devices Provided by the Conference Organizer:

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)

Digital Projectors and Screen

Laser Stick

Materials Provided by the Presenters:

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

Duration of Each Presentation (Tentatively):

Regular Oral Presentation: about **12** Minutes of Presentation and **3** Minutes of Question and Answer

Keynote 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 September 20, 2018.

Keynote Speaker Introduction

Keynote Speaker I



Prof. Jing Bai

University of Minnesota Duluth, USA

Prof. Jing Bai is a tenured Full Professor and the Director of Graduate Studies (DGS) in Department of Electrical Engineering at the University of Minnesota Duluth, where she started as an Assistant Professor in August 2007. She received her Ph.D. degree and MS degree in Electrical and Computer Engineering at Georgia Institute of Technology in 2007 and 2003, respectively. She also earned the MEng degree in Nanyang Technological University (NTU), Singapore in 1999 and the BEng degree in Tsinghua University, P. R. China, in 1996 both in Mechanical Engineering. From 1999 to 2001, she worked at Micromachines Laboratory in NTU as a research engineer. She was also an invited guest researcher at the National Institute of Advanced Industrial Science and Technology (AIST), Japan from May to June 2000. She is the recipient of the 2012 SCSE Young Teacher Award.

Topic: “*Dynamic Behavior of Nonlinear Dispersive Quantum-Cascade Lasing Medium under Different Cavity Configurations*”

Abstract—In this talk, we will present a comprehensive study on the dynamics of coherent pulse propagation in a nonlinear dispersive quantum-cascade laser (QCL) medium emitting at the mid-infrared (MIR) region. Interactions among group-velocity dispersion, longitudinal and transverse Kerr nonlinearities are analyzed. The study is carried out based on the two-level Maxwell-Bloch formalism for QCLs. The coherence effect is accounted through the couplings among the electric field, the polarization and the population inversion. We performed the study on two kinds of typical waveguide configurations, i.e., the ring and Fabry-Perot cavities. Effects of cavity configurations are compared. Results obtained will provide design guidance on MIR QCLs toward desired applications through tailoring various intracavity physics phenomena and cavity configurations.

Keynote Speaker II



Prof. Francis Y. L. Chin
University of Hong Kong, Hong Kong

Prof. Francis Y. L. Chin received his B.A.Sc. degree from the University of Toronto in 1972, and his M.S., M.A. and Ph.D. degrees from Princeton University in 1974, 1975, and 1976, respectively. Prior to joining The University of Hong Kong (HKU) in 1985, he had taught at the University of Maryland, Baltimore County; the University of California, San Diego; the University of Alberta; the Chinese University of Hong Kong; and the University of Texas at Dallas. Professor Chin was the Chair of the Department of Computer Science at HKU and was the founding Head of the Department from its establishment until December 31, 1999. From 2002 until July 31, 2006, he had served as the Associate Dean of the Graduate School. From 2007 to his retirement from HKU in 2015, Prof Chin had served as an Associate Dean of the Faculty of Engineering. Professor Chin is an IEEE Fellow and his research interests include design and analysis of algorithms, machine learning, and bioinformatics including Motif-finding (Motif discovery) and De Novo genome assembly (IDBA). Professor Chin is now an Emeritus Professor of The University of Hong Kong.

Topic: “*Why Genome Assembly so Difficult?*”

Abstract—It has been about 60 years since Watson and Crick first discovered the double-helix structure of DNA. Each genome (about 3 billion long) define every human uniquely (e.g. hair colour, eye colour, etc.) as well as one's genetic diseases. Consequently, there is a need to find the genome of each individual for assessing the genetic risk of potential diseases. At the same time, research groups are sequencing the DNA of all kinds of organisms, e.g., the rice genome in search of higher production yields, the bacteria genome in search of a more effective cure, and the orchid genome in search of more varieties and higher financial returns. To sequence a genome, Next-Generation Sequencing (NGS) technology is commonly used to output billions of overlapping DNA fragments (known as reads) from the genome, but without information on how these reads link together to form the genome. Then, effective sequencing software tools are used to combine these reads to form the genome. This process is called "genome assembly". Theoretically, genome assembly is an easy task as the chance of mis-matching two reads is extremely low if they overlap 30-40 positions (because of $4^{30} \gg 3 \times 10^9$). In this talk, we shall review past developments and difficulties of genome assembly and explain why some of the straightforward approaches fail. The most successful and counter-intuitive approach which breaks the reads into smaller parts before assembly will be introduced. Our recent work to develop more efficient algorithms and software tools for genome assembly will also be discussed.

Keynote Speaker III



Prof. Ming Chen
Zhejiang University, China

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

Topic: “*Non-Coding RNAs and their Versatile Interactions*”

Abstract—Advances in RNA sequencing technologies and computational methodologies have provided a huge impetus to non-coding RNA (ncRNA) study. Previously we developed miRNA target prediction/identification approaches and constructed comprehensive miRNA- and miRNA*- mediated regulatory networks. In this talk, we provide an overview of ncRNA repertoire and highlight recent discoveries of their versatile interactions. Several ncRNA regulatory network studies are introduced: 1.) the effect of 3D architecture of chromatin on the transcriptional regulation of microRNAs; 2.) miRNA–miRNA functionally synergistic network based on the functions of miRNA targets and their topological features in different cancer cell types; 3.) functional elements embedded in lncRNAs and lncRNA-based regulatory networks; and 4.) circRNA–miRNA–mRNA regulatory networks. Moreover, to better investigate the ncRNA-mediated regulation, we describe a comprehensive workflow for in silico ncRNA analysis, providing up-to-date platforms, databases and tools dedicated to ncRNA identification and functional annotation.

Keynote Speaker IV



Prof. Hyoungseop Kim
Kyushu Institute of Technology, Japan

Prof. Hyoungseop Kim received his B.A. degree in electrical engineering from Kyushu Institute of Technology in 1994, the Masters and Ph.D. degree from Kyushu Institute of Technology in 1996 and 2001, respectively. He is a professor in the department of control engineering at Kyushu Institute of Technology. His research interests are focused on medical application of image analysis.

Topic: “*Computer Aided Diagnosis ~ Conventional Pattern Recognition and Deep Learning*”

Abstract—For reducing the load to radiologist and improving of detection accuracy, a CAD (Computer Aided Diagnosis) system is expected from medical fields. In the medical image processing fields, some related works such as artificial neural networks and support vector machine are reported to develop the CAD system as helpful technical issues. In this talk, I will introduce why CAD is required in medical field. Then I will show you some CAD systems such as conventional classifier and deep learning techniques for supporting to radiologists based on pattern recognition techniques.

Keynote Speaker V



Prof. Philip O. Ogunbona
University of Wollongong, Australia

Prof. Philip Olurotimi Ogunbona was educated in Nigeria where he obtained the BSc(Hons)(1st Class) of Electronic and Electrical Engineering from the University of Ife, He studied at the Department of Electrical and Electronic Engineering, Imperial College of Science, Medicine and Technology, University of London and obtained the DIC and PhD for research conducted in the field of Image Processing. He joined the University of Wollongong, School of Electrical, Computer and Telecommunications Engineering in 1990. He left the University in 1998 to join the Visual Information Processing Lab, Motorola Labs in Sydney. He was Principal Research Engineer and later became the foundation Manager of the Digital Media Collection and Management Lab, Motorola Labs, Sydney. While at Motorola Labs, he worked on a range of research projects including, image and video segmentation, image compression (he was part of the Motorola team that worked on the JPEG2000 standardization), digital camera image processing, stereo image processing, multimedia security (watermarking and authentication) and multimedia content management for broadband applications. Apart from the many publications emanating from the research output, Philip was also co-author of several patent disclosures. He currently has four patents filed in the US and has published over 100 journal and conference papers. His current research interests include image and video processing, video surveillance, multimedia security and multimedia content management. He is a Senior Member of the IEEE and member of the IEEE NSW Committee. He has also served as the Chair of the IEEE Joint Chapter of the Communications and Signal Processing. In 2004, Philip returned to the University of Wollongong, School of Information Technology and Computer Science, where is now Professor and Head of School. He is also the Director of the Centre for Visual Information Processing and Content Management Research within the School.

Topic: “*Engineering in the Age of Deep Learning*”

Abstract—Machine learning, especially deep learning has recently revolutionized the landscape of engineering and computer science research and practice. In this key note address we provide a survey of some of the important results in the last 5 years. This survey will take us through aspects of power engineering, control engineering, communication engineering, computer vision, medical image analysis and social media data analytics. We conclude the address with examples of our work in computer vision.

Keynote Speaker VI



Dr. Lucia Ballerini
University of Edinburgh, UK

Dr. Lucia Ballerini is an expert in image analysis. She developed novel image analysis algorithms and demonstrated their successful applications in many domains. She published over 100 peer-reviewed scientific articles. Lucia Ballerini graduated in Electronic Engineering at the University of Florence in 1993. She received the PhD degree in Bioengineering in 1998, and the "Docent" in Image Analysis at Uppsala University in 2006. She has been working at the Centre for Image Analysis, Uppsala and at the European Centre for Soft Computing, Mieres, Spain. She moved to Edinburgh, UK in 2008, where the main projects she has been involved are:

Dermofit: <http://www.dermofit.org> (now a commercial product)

VAMPIRE: <http://vampire.computing.dundee.ac.uk/> (software suite for retinal image analysis distributed to many centres around the world)

She is now a Research Associate in brain imaging at the University of Edinburgh, working on these projects: LBC1936: <https://www.lothianbirthcohort.ed.ac.uk/> (developing image analysis tools for brain MRI structural analysis)

EPSRC Multi-modal retinal biomarkers for vascular dementia: developing enabling image analysis tools
Leducq <https://www.small-vessel-disease.org/> (working on quantitative computational methods for assessing Perivascular Spaces)

Topic: “*Image Analysis in Small Vessel Disease*”

Abstract—Small vessel diseases (SVDs) are a group of disorders that result from pathological alteration of the small blood vessels in the brain. It is responsible for a large proportion of the cases of stroke and dementia worldwide. Magnetic Resonance Imaging (MRI) images from patients with SVD show characteristic abnormalities, such as white matter hyperintensities (WMHs), cerebral microbleeds, lacunes and enlarged perivascular spaces (PVS). In this talk I will review MRI imaging protocols and emerging imaging methods for detection and quantification of features of SVD.

Brief Schedule of Conference

Day 1	September 19, 2018 (Wednesday)		
	Venue: Lobby of Conference Room One (No. 2 Teaching Building, First Floor, Academic Center) Arrival Registration 10:00-17:00		
Day 2	September 20, 2018 (Thursday) 09:00-18:45		
	Morning Conference: Conference Room One (No. 2 Teaching Building, First Floor, Academic Center)		
	Venue: Conference Room One (No. 2 Teaching Building, First Floor, Academic Center)		
	08:50-09:05 Welcome Address (Prof. Bowen Cheng and Prof. Zhitao Xiao)		
	09:05-09:35 Keynote Speech I (Prof. Jing Bai)		
	09:35-10:05 Keynote Speech II (Prof. Francis Y. L. Chin)		
	10:05-10:35 Keynote Speech III (Prof. Ming Chen)		
	10:35-11:00 Coffee Break & Group Photo		
	11:00-11:30 Keynote Speech IV (Prof. Hyungseop Kim)		
	11:30-12:00 Keynote Speech V (Prof. Philip O. Ogunbona)		
12:00-12:30 Keynote Speech VI (Dr. Lucia Ballerini)			
Lunch: 12:30-13:30 Venue: Han Restaurant in Gongda Hotel (韩餐厅)			
Afternoon Conference (No. 2 Teaching Building)			
Session 1: 13:30-16:00	Session 2: 13:30-16:00	Session 3: 13:30-15:45	
Venue: Conference Room One	Venue: Conference Room Two	Venue: Conference Room Four	
Topic: "Bioinformatics and Basic Medicine" 10 presentations	Topic: "Image Processing Technology and Method" 10 presentations	Topic: "Modern Electronic Information Technology and Application" 9 presentations	
Coffee Break 16:00-16:15			
Session 4: 16:15-18:30	Session 5: 16:15-18:30	Session 6: 16:15-18:45	
Venue: Conference Room One	Venue: Conference Room Two	Venue: Conference Room Four	
Topic: "Medical Image Analysis and Clinical Application" 9 presentations	Topic: "Communication and Signal Processing" 9 presentations	Topic: "Power System and Electrical Engineering" 10 presentations	
Poster Session (13:30-18:45)			
18:45-20:00 Dinner (Han Restaurant in Gongda Hotel 韩餐厅)			
Day 3	9:00-18:00 Academic Visit & Tour		

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

Detailed Schedule of Conference

September 19, 2018 (Wednesday)

Venue: Lobby of Conference Room One (No. 2 Teaching Building, First Floor, Academic Center)

10:00-17:00	Arrival and Registration
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September 20, 2018 (Thursday)

Venue: Conference Room One (No. 2 Teaching Building, First Floor, Academic Center)

08:50-09:05	Welcome Address
	 <p>Prof. Bowen Cheng Vice-president of Tianjin Polytechnic University, Tianjin China</p>
09:05-09:35	Keynote Speech I
	 <p>Prof. Jing Bai University of Minnesota Duluth, USA Topic: “Dynamic Behavior of Nonlinear Dispersive Quantum-Cascade Lasing Medium under Different Cavity Configurations”</p>
09:35-10:05	Keynote Speech II
	 <p>Prof. Francis Y. L. Chin University of Hong Kong, Hong Kong Topic: “Why Genome Assembly so Difficult?”</p>
10:05-10:35	Keynote Speech III
	 <p>Prof. Ming Chen Zhejiang University, China Topic: “Non-Coding RNAs and their Versatile Interactions”</p>
10:35-11:00	Coffee Break & Group Photo

2018 CBEES-BBS TIANJIN, CHINA CONFERENCE

11:00-11:30		<p>Keynote Speech IV Prof. Hyoungseop Kim Kyushu Institute of Technology, Japan Topic: “Computer Aided Diagnosis ~ Conventional Pattern Recognition and Deep Learning”</p>	
11:30-12:00		<p>Keynote Speech V Prof. Philip O. Ogunbona University of Wollongong, Australia Topic: “Engineering in the Age of Deep Learning”</p>	
12:00-12:30		<p>Keynote Speech VI Dr. Lucia Ballerini University of Edinburgh, UK Topic: “Image Analysis in Small Vessel Disease”</p>	
12:30-13:30	Lunch (Han Restaurant in Gongda Hotel 韩餐厅)		
	Afternoon Conference Venue: No. 2 Teaching Building		
13:30-16:00	<p>Session 1 Venue: Conference Room One Topic: “Bioinformatics and Basic Medicine”</p>	<p>Session 2 Venue: Conference Room Two Topic: “Image Processing Technology and Method”</p>	<p>Session 3 Venue: Conference Room Four Topic: “Modern Electronic Information Technology and Application”</p>
16:00-16:15	Coffee Break		
16:15-18:45	<p>Session 4 Venue: Conference Room One Topic: “Medical Image Analysis and Clinical Application”</p>	<p>Session 5 Venue: Conference Room Two Topic: “Communication and Signal Processing”</p>	<p>Session 6 Venue: Conference Room Four Topic: “Power System and Electrical Engineering”</p>
13:30-18:30	Poster Session		
18:45-20:00	Dinner (Han Restaurant in Gongda Hotel 韩餐厅)		

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 September 20, 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, September 20, 2018 (Thursday)

Time: 13:30-16:00

Venue: No. 2 Teaching Building-Conference Room One

Session 1: Topic: “Bioinformatics and Basic Medicine”

Session Chair: Assoc. Prof. Zhenqiu Liu

<p>B0002 Session 1 Presentation 1 (13:30-13:45)</p>	<p>Analysis MicroRNA-Gene Co-Modules in Glioblastoma Multiforme Based on Integrative Two Types of Genomic Data Jin Deng, Wei Kong, Huimin Wang, Shuaiqun Wang and Xiaoyang Mou Shanghai Maritime University, China</p> <p><i>Abstract</i>—Glioblastoma multiforme (GBM) is the most common primary central nervous system tumor. Although treatment continues to make progress in the past, the pathogenesis is still unknown to a large extent. MicroRNA (miRNA) is known to regulate cooperatively the expression of gene profiles in the post transcriptional stages and affect many crucial biological processes. The majority of the existing researches on GBM transcriptional regulation mechanism devoted to global analysis only on gene expression data, disregarding the complex coordination between miRNA and gene expression profiles. With the development of high throughput biotechnology and computational biology, it is possible to simulate and understand the regulatory role in cellular process by integrating gene expression profiles with miRNA data. In this article, we adopt the joint Non-negative Matrix Factorization Algorithm (JNMF) to integrate miRNA data and gene expression data to form co-modules. In addition, the characteristic co-modules and the number of miRNA related with GBM were identified by correlation analysis, thus constructing miRNA-gene regulation network to speculate the pathogenesis of GBM. The results demonstrated that the characteristic co-modules showed a significant biological correlation and potential association with GBM. Furthermore, GO biological processes and KEGG enrichment analysis further revealed the biological functions of miRNA targets gene in co-modules.</p>
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<p>B0008 Session 1 Presentation 2 (13:45-14:00)</p>	<p>Topology-Optimized Design of Microporous Filling Prosthesis Wei Chen, Ning Dai, Zhipeng Wang, Hao Liu and Qingqiang Yao Nanjing University of Aeronautics and Astronautics, China</p> <p><i>Abstract</i>—One of the main reasons for the loosening of the femoral stem prosthesis is that the femoral stem prosthesis is difficult to joint and grow in the femoral cavity. Thus, a new design method is proposed to reduce the risk of prosthesis loosening. Firstly, we use the image data of X-ray and CT to extract the characteristic parameters of the femoral cavity and design the prosthesis with the characteristic parameters. Secondly, the model is improved with topology-optimized design, to make it have better mechanical performance. Then, we use the microporous units to fill the deletion region of the optimized model, the prosthesis can be conformal and achieves good biological performance. Finally, the performance of the prosthesis is validated and evaluated by the finite element analysis (FEA).The design method has obvious effect on the quality reduction of prosthesis, its weight is 40% lower than that of the mainstream solid prosthesis. The effect of increasing the surface area also is obvious, which is 3.4 times of solid prosthesis. The mechanical performance is more excellent and meets the design requirements, whose stress shielding rate decreased by 10%. The prosthesis with the optimized filling design has the strength close to the solid prosthesis. But it is lighter in weight and has more surface area, its stress shielding rate is lower than solid prosthesis, which will help to improve the comfort of postoperative recovery and the joint and growth between prosthesis and femoral cavity. This method greatly reduces the risk of loosening of the prosthesis and improves the quality of life of patients.</p>
<p>B0018 Session 1 Presentation 3 (14:00-14:15)</p>	<p>Optical Parameters of Tissue Phantoms Measurement Based on DPDW with Multi-frequency Modulation Huiquan Wang, Fang Xia, Zhe Zhao, Xinwei He and Jinhai Wang Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—The measurement of the optical parameters of tissues plays an important role in detecting human diseases and tissue function. On the basis of the frequency-domain near-infrared spectroscopy method, this study obtained the optical parameters of the phantoms with the technology of Diffuse Photon Density Waves (DPDW) under the multi-frequency modulation to detect the optical parameters of tissues, which is based on the light transmission process and the diffuse transmission theory. A DPDW optical parameter measurement system, which uses Intralipid solutions as the research objects, was built. The output amplitude and phase were fitted by the optical radiation equation to obtain the absorption coefficient and the reduced scattering coefficient of the phantoms. The experimental results show that DPDW system with multi-frequency modulation can detect the optical parameters of the</p>

	tissues quickly and accurately, which is helpful for the research of the composition and internal structure of tissues.
B1006 Session 1 Presentation 4 (14:15-14:30)	<p>Analysis the Action Mechanism of Pyrazole Derivatives EH-1 That Induces Triple Response in Arabidopsis Seedlings by Using RNA-Sequencing Keimei Oh, Kenji Ueda and Kojiro Hara Akita Prefectural University, Japan</p> <p><i>Abstract</i>—We have previously reported the discovery of pyrazole derivative EH-1 displayed biological activity on inducing triple response in dark grown Arabidopsis seedlings. To improve our understanding of the action mechanism of EH-1, we conducted RNA-sequencing analysis of EH-1 treated Arabidopsis seedlings. Data present in this article for the first time demonstrated that EH-1 did not significantly induce ethylene responsive genes of ethylene receptors and/or ethylene signaling components in compared with none chemical treated control. However, we found that the expression levels of several genes were significantly increased by the treatment of EH-1 and ACC, the precursor of ethylene biosynthesis. This result indicates that the EH-1 induced the expression of some genes which are common to ethylene. We also found that there are several genes significantly induced by EH-1 but not induced by ACC. Our results suggest that the action mechanism of EH-1 shares with ethylene on inducing triple response in Arabidopsis seedlings but the primary site of action between EH-1 and ethylene are different.</p>
B0028 Session 1 Presentation 5 (14:30-14:45)	<p>Dynamic Correlation Analysis and Its Applications in Single Cell and Bulk RNA-Seq Data Tianwei Yu Emory University, USA</p> <p><i>Abstract</i>—Dynamic correlations are pervasive in high-throughput data. Large numbers of gene pairs can change their correlation patterns in response to observed/unobserved changes in physiological states. Finding changes in correlation patterns can reveal important regulatory mechanisms. Currently there is no method that can effectively detect global dynamic correlation patterns in a dataset. Given the challenging nature of the problem, the currently available methods use genes as surrogate measurements of physiological states, which cannot faithfully represent true underlying biological signals. In this study we develop a new method that directly identifies strong latent dynamic correlation signals from the data matrix, named DCA: Dynamic Correlation Analysis. At the center of the method is a new metric for the identification of pairs of variables that are highly likely to be dynamically correlated, without knowing the underlying physiological states that govern the dynamic correlation. We validate the performance</p>

	<p>of the method with extensive simulations. We applied the method to three real datasets: a single cell RNA-seq dataset, a bulk RNA-seq dataset, and a microarray gene expression dataset. In all three datasets, the method reveals novel latent factors with clear biological meaning, bringing new insights into the data.</p>
<p>B0021 Session 1 Presentation 6 (14:45-15:00)</p>	<p>A Simulated Annealing White Balance Algorithm for Foreign Fiber Detection Zhichao Zhou, Yuhong Du, Yuqin Du, Jintian Yun and Renjie Liu Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—In order to accurately process the image of the foreign fiber in cotton during the detection and removal process, the white balance of the foreign fiber sorter's camera needs to be studied. In this paper, the white balance parameters of the camera are extracted, and the relationship between camera gain, exposure time and white balance value of the foreign fiber sorter is determined. Then, a white balance algorithm is applied to the foreign fiber sorter camera based on the regression equation, where the parametric model is established by a white balance simulated annealing algorithm and the regression equation. Application of the algorithm on a foreign fiber sorter to automatically determine the optimal white balance of the camera shows that the complex parameter optimization process can be simplified and detection efficiency can be improved.</p>
<p>B1008 Session 1 Presentation 7 (15:00-15:15)</p>	<p>A Novel Compound Targeting Creb1-Tgfβ2-Erk Signaling in Esophageal Cancer Bin Li Jinan University, China</p> <p><i>Abstract</i>—Imperatorin is a bioactive ingredient extracted from the root of <i>Angelica dahurica</i>, a traditional Chinese medicine. Imperatorin has been reported to have traditional curative effects including anti-inflammatory, anti-coagulant and anti-bacterial. Recent studies showed that imperatorin may inhibit tumor growth and induce apoptosis. However, it is still unknown whether it can inhibit tumor invasion and metastasis. In addition, the effect of imperatorin in ESCC cells remains unclear. Furthermore, the underlying mechanism show imperatorin influences cancer cells were scarcely studied. This study aims to explore the biological significance of Imperatorin in cancer invasion and metastasis, and illustrate the molecular mechanisms involved. The in vitro and in vivo experiments demonstrated that imperatorin significantly suppressed the invasive and metastatic potential of ESCC cells without significant toxic effects. Western blot analysis indicated that imperatorin regulated the expression levels of EMT markers including Fibronectin, N-cadherin and E-cadherin, and inactivated the ERK signaling pathway.</p>

	<p>Bioinformatics analysis of proteomics data suggested that TGFβ2 may play an important role in the biological functions of imperatorin, which was confirmed by the decreases in expression and secretion of TGFβ2 in imperatorin-treated ESCC cells. Mechanistically, we found that Imperatorin may directly bind to CREB1, a known upstream regulator of TGFβ2, and inhibit its phosphorylation and therefore reduce TGFβ2 transcription and expression. In summary, Imperatorin can reduce the expression and secretion of TGFβ2 via regulating CREB1, and then inhibit the phosphorylation of ERK, as a result, suppressing the invasion and metastasis of ESCC cells.</p>
<p>B0017 Session 1 Presentation 8 (15:15-15:30)</p>	<p>Drug-Target Interaction Prediction with Weighted Bayesian Ranking ZeZhi Shi and Jianhua Li East China University of Science and Technology, China</p> <p><i>Abstract</i>—Identifying drug-target interactions (DTIs) through biochemical experiments is very expensive and time-consuming. Therefore, it is an inevitable trend to use computational methods to predict the drug-target interactions, and high prediction accuracy becomes our ultimate goal. However, most existing computational methods treat the non-interaction data as negative samples which is unreasonable as those non-interaction data may contain undetected drug-target interactions. In this paper, a novel weighted Bayesian ranking method (WBRDTI) for drug-target interactions prediction is proposed, and the different effects of each drug-target pair also is taken into account. Besides, dual similarity is used to regularize the latent factors of drugs and targets respectively, and known neighbor information is used to smooth novel drug or target. Finally, the experiment results on widely used publicly available drug-target interaction datasets show its effectiveness and the practicality of the proposed method.</p>
<p>B1007 Session 1 Presentation 9 (15:30-15:45)</p>	<p>Mir-29c Suppresses 5-Fu Chemoresistance Through Regulation of Fbxo31 in Esophageal Cancer Wen Wen Xu Jinan University, China</p> <p><i>Abstract</i>—Esophageal cancer ranks as the 6th most frequent cause of cancer death in the world. Chemoresistance is a major obstacle in cancer therapy, but the mechanism remains unclear. MicroRNAs have received increasing attention as a novel and promising targets in cancer diagnosis, prognosis and treatment. Identification and experimental validation of the chemoresistance-related miRNAs in esophageal cancer are urgently needed. We have established esophageal squamous cell carcinoma (ESCC) cell line models of acquired chemoresistance to 5-FU (FR sublines). MicroRNA profiling and subsequent RT-PCR confirmation showed that miR-29c was one of the most down-regulated miRNA in FR</p>

	<p>sublines. We found that miR-29c overexpression could revert acquired chemoresistance of FR cells, and that lower miR-29c expression in ESCC was associated with poor survival of patients. FBXO31, a novel F Box protein with prognostic significance in ESCC, was amongst the upregulated mRNAs identified in the FR cells using cDNA microarray and was predicted by computational algorithms to be a target of miR-29c. Our data showed that FBXO31 increased chemoresistance of ESCC cells in vitro and in vivo, and that ectopic expression of miR-29c significantly reduced FBXO31 expression. More importantly, FBXO31 mediated the functions of miR-29c in chemoresistance of ESCC cells. In summary, this study greatly enhances our understanding of the functions of miR-29c and FBXO31 in esophageal cancer; their significance in diagnosis, prognosis and treatment warrants further investigation.</p>
<p>B1003 Session 1 Presentation 10 (15:45-16:00)</p>	<p>Validation of Short-Term Blood Glucose Prediction Algorithms Evgeniia L. Litinskaia, Pavel A. Rudenko, Kirill V. Pozhar and Nikolai A. Bazaev National Research University of Electronic Technology, Russia Federation</p> <p><i>Abstract</i>—Algorithms for model predictive control as well as mathematical models themselves need effectiveness evaluation. In the work are considered physiological, neural network based and empirical models, their special aspects and methods of approbation. DirecNet open-access database clinical protocols were processed and used for empirical sigma-model based algorithm tests. The general concept of developed short-term prediction algorithm based sigma-model is to compare the measured and the modeled BG. Processing this data the algorithm generates its outputs and performs further BG prediction. The DirecNet data allows providing effective prediction algorithm and empirical mathematical model evaluation. Primary tests show that sigma-model based algorithm is unsusceptible to patient physiological quasi-constant parameters variability and is susceptible to noise level. Relative deviation of prognosis with added 25% normal noise is less than 20%.</p>

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, September 20, 2018 (Thursday)

Time: 13:30-16:00

Venue: No. 2 Teaching Building-Conference Room Two

Session 2: Topic: “Image Processing Technology and Method”

Session Chair: Prof. Shanmugavadivu Pichai

<p>B1009 Session 2 Presentation 1 (13:30-13:45)</p>	<p>Image Reconstruction Based on Structured Sparsity for Electrical Impedance Tomography Qi Wang, Jing He, Jianming Wang, Xiuyan Li and Xiaojie Duan Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—Electrical impedance tomography (EIT) is a tomographic imaging modality for reconstructing the conductivity distribution through boundary current injection and induced voltage measurement. High-quality image is of great significant for improving the qualitative imaging performance in biomedical application. In this paper, the structured sparsity algorithm is proposed to incorporate with the underlying structure of the conductivity on the basis of the sparse priors. The structured sparsity is integrated into the iterative process of the Symkaczmarz algorithm for EIT image reconstruction. Both simulation and experiment results indicate that the proposed method has feasibility for pulmonary ventilation imaging and great potential for improving the image quality.</p>
<p>B3025 Session 2 Presentation 2 (13:45-14:00)</p>	<p>FPGA Implementation of Pulse Coupled Neural Network on for Time Series of an Image Zang Xinzhe, Gao Zhenbin, Li Mengyuan and Wang Xia Hebei University of Technology, China</p> <p><i>Abstract</i>—Pulse Coupled Neural Network (PCNN) is biologically inspired neural networks, which has a good application in image processing, such as segmentation, enhancement, recognition, edge detection and so on. This paper presents a general VHDL modeling of PCNN, that is targeted for FPGA implementation, and can also be used with advantage for ASIC. First, the basic PCNN theory model is analyzed; and then the detail designed of each sub-module of the</p>

	<p>hardware is given; at last, the VHDL model is proved by comparing the time series output from FPGA simulation and that from theoretical calculation of the same image. The FPGA hardware implementation may be considered a platform for further, extended implementations and easily expanded into various applications.</p>
<p>B3026 Session 2 Presentation 3 (14:00-14:15)</p>	<p>An Exploratory Analysis of Speckle Noise Removal Methods for Satellite Images A. Shanthasheela and P. Shanmugavadivu The Gandhigram Rural Institute (Deemed to be University), India</p> <p><i>Abstract</i>—Satellite images captured in a variety of modalities serve as the primary source for many applications. Satellite image processing extracts the image /spectral information represented in the form of pixels, classifies those pixels based on the similarity measures and further analyzes the inherent data, as per the requirements. The foremost objective of satellite processing is to automatically categorize the pixels in an image into the respective land cover class labels or themes. These pixels are classified by its spectral information and it is determined by the relative reflectance in various bands of wavelength. The accuracy and outcomes of any satellite image processing procedure, irrespective of the application domain, directly depends on its quality. Satellite images are invariably degraded by speckle noise. Hence, preprocessing the images for speckle noise suppression and/or cloud removal is deemed an inevitable component in satellite image processing. Researchers have proposed a spectrum of methods for speckle noise/cloud removal. A detailed review on the significant research publications on speckle noise removal are summarized in this article. The consolidation of methodology merits and demerits of the select research articles are presented in this paper. This review article on speckle noise removal is designed as a ready-reference for those researchers working in satellite image processing.</p>
<p>B4030 Session 2 Presentation 4 (14:15-14:30)</p>	<p>Character Segmentation of Digital-Display Temperature and Humidity Instrument Based on Contour Features and Structural Rules Wen Wang, Zenglai Gao, Lei Geng, Fang Zhang and Zhitao Xiao Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—In order to solve the problems of different types of digital-display temperature and humidity instrument segmentation such as imprecision, light influence and low generality, this paper proposes a method based on contour features and structural rules. Firstly, use the Canny edge detection method to extract the display screen, and utilize straight-line correction algorithm to do the screen correction. Then, characters are coarsely segmented based on the contour features and the different gray values between characters and background. Finally,</p>

	<p>accurate segmentation is done according to vertical projection and character structure rules. In this paper, the character segmentation is carried out with different types of digital-display temperature and humidity instruments. The experimental results show that the method can accurately segment the effective characters on different types of instruments.</p>
<p>B3013 Session 2 Presentation 5 (14:30-14:45)</p>	<p>An Oblique Sprint Algorithm with Eight Directions for Micromouse Contests Chenhu Yuan, Qi Liu and Xiaoming Liu Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—According to IEEE micromouse standards, micromouse needs to find the shortest path in the maze that has been searched, and sprint with the fastest velocity, the shortest path and the least number of turns. To ensure the shortest path of micromouse in the maze that has been explored, it is necessary to plan the existing paths. Therefore, an Oblique sprint algorithm with eight directions is proposed in this article. The algorithm divides the maze cell into eight directions, records the running direction of the micromouse in the maze, finds out the shortest path through the contour map, makes the direction map on this path, and then integrates the direction map into the actual running action. Through this algorithm, the optimal design of sprint path and action mode is realized. By comparing with the traditional algorithm, it is demonstrated that the new algorithm solved the problems of the traditional sprint algorithm, such as long distance and many actions, reduced the number of turns, and improved the sprint efficiency of micromouse in the maze.</p>
<p>B4013 Session 2 Presentation 6 (14:45-15:00)</p>	<p>Statistical Shape Model Generation Using <i>K</i>-Means Clustering Jiaqi Wu, Guangxu Li, Huimin Lu and Hyoungseop Kim Kyushu Institute of Technology, Japan</p> <p><i>Abstract</i>—Statistical shape models (SSMs) is a robust and efficient method in medical image segmentation. In this paper, a novel landmark corresponding method based on k-means clustering and demons registration is proposed to train a 3-D statistical shape model with higher quality. The k-means clustering method is performed on the original geometric surface to obtain a simplified surface as standard set of landmarks to find correspondent landmarks on each mapped spherical surface obtained from demon registration in the training set. Twenty cases of left lung and right lung regions in thoracic MDCT images are used in the experiment to build two SSMs. Performance evaluation results show that SSMs generated by the proposed method achieve better generalization ability, specificity and compactness while maintaining the same accuracy of segmentation as those reported by state-of-the-art methods.</p>

<p>B0014</p> <p>Session 2</p> <p>Presentation 7</p> <p>(15:00-15:15)</p>	<p>Flexible Sentence Analysis Model for Visual Question Answering Network</p> <p>Wei Deng, Jianming Wang and Shengbei Wang and Guanghao Jin Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—Nowadays, visual question answering (VQA) has attracted much attention in both computer vision and natural language processing. Generally, a VQA system adopts sentence analysis models that decompose the sentence to short parts to analyze the user’s attempt and merge partial results to get final answer. Despite the success of those models, the correct analysis of long length questions still remains as a key problem in VQA case. Especially, when a sentence produces comprehensive deviation due to different situation or customs of questioners, the sentence analysis model might output a wrong answer and lead to severe performance drop of the VQA system. To tackle the problem, a new sentence comprehension model has been proposed in this paper. The model is named flexible analysis model and is mainly used to deal with the sentences related to object counting. In human dialogue case, when the first answer went wrong, people would change a way to comprehend the sentence for finding the correct answer. Inspired by the mechanism, the flexible sentence analysis model tries another different way to comprehend the sentence after the sentence is given a wrong number answer, and the VQA system can generate a new answer according to the new output. Our model was tested on CLEVR dataset, and the experiment result shows that our method improved the accuracy nearly 10.5\% in long sentence cases. It proves that our network has better performance on both correctness and robustness.</p>
<p>B4011</p> <p>Session 2</p> <p>Presentation 8</p> <p>(15:15-15:30)</p>	<p>Artistic Style Transfer for 3D Surfaces</p> <p>Jiying Chang, Guangxu Li and Chengshan Ding Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—Simulating the style of an artist requires a lot of time and energy, and the effects are uneven. Doing this for a surface was hard to imagine. Nowadays computer technology offers unlimited possibilities. We propose a method of transferring style from one image to the 3D surface. We use the latest advances in style transitions in 2D images and add surface parameterization methods that apply to 3D surface. This allows us to make an adaptive texture map of the 3D surface, even in the case of the 3D surface of complex topologies.</p>
<p>B1010</p> <p>Session 2</p> <p>Presentation 9</p>	<p>Automatic 3D Aorta Segmentation in CT Images</p> <p>Xiaojie Duan, Meisong Zhang, Jianming Wang and Qingliang Chen Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—Cardiovascular disease is one of the most common high</p>

(15:30-15:45)	<p>incidence diseases, which leads to the urgent demand of 3D aorta shape reconstruction with CT images for help doctors making effective and accurate diagnosis. In literature, 3D aorta reconstruction methods with CT images mainly were based manual or semi-automatic operations, which would limit the practical applications of the technique. In the paper, a fully automatic 3D aorta segmentation algorithm was proposed. Firstly, the 2D shape of aortic arch in a CT image was utilized to locate the 3D position in CT image sequence. Then, a level set method was adopted to segment all the aortic edge in the whole CT image sequence by taking the aortic arch edge as the initial contour. Finally, the algorithm was testified on CT image dataset, and the experimental results show that our method can reconstruct the 3D shape with CT image full automatically.</p>
<p>B1011 Session 2 Presentation 10 (15:45-16:00)</p>	<p>Automatic Aortic Dissection Recognition Based on CT Images Xiaojie Duan, Xiaobing Shi, Jianming Wang and Qingliang Chen Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—In order to improve diagnostic rate of aortic dissection, the aortic dissection three-dimensional (3D) reconstruction system is indispensable. Recognition and segmentation of aortic dissection is an indispensable part of 3D reconstruction. Thus, an automatic recognition algorithm of aortic dissection based on CT images is proposed in this paper. According the characteristics of CT image noise, we choose filtering and sharpening to preprocess the image. The GVF Snake algorithm is used when segment aortic dissection in CT images, and then the edge information of the aortic region is extracted by the Sobel operator. The edge image of the aorta is projected by the Radon transformation principle, and the projection data is combined with the perimeter and area characteristics of the aortic region to judge whether the aortic dissection exists. In order to reduce the harm caused by misjudgment, the minimum Bayes risk decision can be used</p>

Session 3

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Afternoon, September 20, 2018 (Thursday)

Time: 13:30-15:45

Venue: No. 2 Teaching Building-Conference Room Four

Session 3: Topic: “Modern Electronic Information Technology and Application”

Session Chair: Prof. Chandra Eswaran

<p>B4016 Session 3 Presentation 1 (13:30-13:45)</p>	<p>Efficient Design of Sparse Multiplierless FIR Filters with Low Complexity Wei Xu, Anyu Li, Ruihua Zhang and Boya Shi Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—FIR filters have many advantages such as linear phase, high precision and good stability. However, when the performance is required to be high, usually a higher order is required, resulting in greatly increased hardware complexity of the FIR filter. Based on sparse FIR filter design algorithm and common subexpression elimination method, a novel algorithm to design the FIR filters with low complexity. First, a sparse FIR benchmark filter that fulfills frequency response specifications is yielded from the sparse filters design algorithm. Then, each quantized filter coefficient is represented in CSD. And the weight of all subexpressions and isolated nonzero digits of the quantized coefficient set are computed. Finally, the filter coefficient set with lower implementation cost is constructed by iteratively admitting subexpressions and isolated nonzero digits according to their weight. The simulation results show that the proposed algorithm can saves about 29% of adder compared with other low complexity filter design algorithms, which effectively reduces the implementation complexity and greatly saves the hardware cost.</p>
<p>B4020 Session 3 Presentation 2</p>	<p>Least Squares Design of 2-D FIR Notch Filters Based on the Hopfield Neural Networks Wei Xu, Ruihua Zhang, Anyu Li, Boya Shi and Shuxia Yan Tianjin Polytechnic University, China</p>

(13:45-14:00)	<p><i>Abstract</i>—This paper presents a design paradigm for the 2-D (two-dimensional FIR (finite impulse response) notch filter using Hopfield neural network. A Hopfield neural network is chosen and the relationship between the least squares error criterion and the Lyapunov energy function is established. The design problem is transformed into the problem of finding the minimum value of the Lyapunov energy function. When the minimum value of the Lyapunov energy function is obtained, the outputs of the Hopfield neural network are the coefficients of the 2-D FIR notch filter. The complexity of computation can be reduced by using the Hopfield neural network. The simulation results demonstrate the effectiveness of the proposed algorithm.</p>
<p>B4023 Session 3 Presentation 3 (14:00-14:15)</p>	<p>Adaptive Detection and Correction of Fixed Pattern Noise in sCMOS Cameras Hua Bai, Yamei Yang Yan Liu, Junfa Zhao and Cheng Zhang Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—In the field of scientific research, there are high requirements for image quality. In recent years, the emergence of scientific CMOS (sCMOS) cameras has provided a favorable tool for this demand, but when applied in special circumstances, there is inevitably appearing fixed pattern noises(FPN), damaging image details. This paper presents a new method for detecting FPN and correcting the detected results adaptively in images. The detection algorithm is divided into dark-scene detection and illuminated- scene detection, dark-scene detection makes use of the simulation of FPN detection, the detection accuracy is up to 99.13%. For the illuminated-scene detection requirements, an adaptive threshold algorithm is proposed. Based on the FPN detection results, performing a 3×3 window median grayscale substitution algorithm to correct them one by one. The experimental results show that the algorithm can detect the position coordinate information of FPN accurately, remove the influence of FPN effectively, and can be widely applied to sCMOS cameras with high requirements for image quality.</p>
<p>B3019 Session 3 Presentation 4 (14:15-14:30)</p>	<p>Research of Science and Technology Strategic base on The International Technology Roadmap for Semiconductors Zhang Xiaopei, Li Shaoshuai and Yu Hejun Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—This article analysed the international technology roadmap for semiconductors.From discussed the background,content,organization and characteristics,this article suggestioned to improve science and technology strategy research.It is necessary to do strategic research on important academic subjects and industrial technologies by the roadmap methodology and update regularly.The organization framework,such as the management board,work groups and supporting office,guarantees the</p>

	<p>success of a roadmap research. International cooperation and collaborative innovation play very important roles to enhance the innovation quality of a roadmap.</p>
<p>B0035 Session 3 Presentation 5 (14:30-14:45)</p>	<p>A Novel Soft Actuator for Continuum Soft Robot Arm Zahra S. Navabi and Debao Zhou University of Minnesota Duluth, USA</p> <p><i>Abstract</i>—This paper presents a novel pneumatic soft actuator for continuum robotic arms. In this actuator, by utilizing the unstability of silicone rubber, the need for multiple air tubes to have multiple independent inflating chambers has been removed. To control which part to be inflated and to add more degrees of freedom to the actuator, shape memory alloy (SMA) springs have been used in the actuator structure. The resultant actuator can produce a high displacement and can maintain its final state without consuming energy. The goal for designing such an actuator is to decrease the size of current soft pneumatic continuum robotic arms by reducing the number of air supply tubes while preserving the number of degrees of freedom of the continuum robot arm. The current paper discussed the main principles behind the actuator design, the behavior of the first prototype of the actuator and the main aspects of controlling the actuator. In the end, the possible improvements and main issues regarding the enhancement of the actuator function have been discussed.</p>
<p>B0011 Session 3 Presentation 6 (14:45-15:00)</p>	<p>A Subset Selection Algorithm For Multivariate Modelling Based On The Spectral Variations Zhe Li, Jinchao Feng and Kebin Jia Beijing University of Technology, China</p> <p><i>Abstract</i>—This paper proposes a subset selection method, named sample set partitioning based on joint x-y-z distances (SPXYZ) algorithm, for multivariate modelling. The proposed method is a modified version of the original sample set partitioning based on joint x-y distances (SPXY) algorithm. The contributions from the dependent variable (z) space for parameters that cause the systematic error in measured spectra, including external factors and inherent characteristics, are added to the original SPXY algorithm. Here, the z differences denotes the variability in the dimension of external disturbances and inherent characteristics. Based on two real world datasets, SPXYZ is employed with partial least-squares (PLS) to demonstrate the advantages of subset selection by adding the contributions from external factor, i.e., temperature and inherent characteristic, i.e., background components. We compare the prediction performance of SPXYZ-PLS model with other three PLS models using random sampling (RS), Kennard-Stone (KS) and SPXY. The prediction performance results from experimental studies showed that the prediction</p>

	<p>performance of SPXYZ-PLS is significantly better than the other models. Therefore, the proposed method is an alternative method of subset selection for calibration modeling.</p>
<p>B3016 Session 3 Presentation 7 (15:00-15:15)</p>	<p>Reliability Evaluation of Complex Equipment Based on Virtual Samples and Performance Degradation Xinchao Zhao and Weimin Lv Naval Aeronautical University, China</p> <p><i>Abstract</i>—Aiming at the difficulties in reliability evaluation of small samples and multi-performance parameter products, a reliability evaluation method based on virtual samples and performance degradation is proposed. Firstly, the multi-performance parameter distance concept is introduced, and the original parameter is virtual augmented with the performance parameter distance. Secondly, the improved Elman neural network is used to process the sample to obtain the complete degradation trajectory. Finally, this method is combined with the performance prediction method based on performance degradation to process the degradation data of a certain type of space relay and obtain a lifetime of 128 hours. The result shows the method effectively solves the processing problem of the rare sample data in the accelerated degradation test, which has certain reference significance.</p>
<p>B4019 Session 3 Presentation 8 (15:15-15:30)</p>	<p>Review of Neuro-Space Mapping Method for Transistor Modeling Shuxia Yan, Xu Dong, Xiaoyi Jin, Weiguang Shi and Wei Xu Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—This paper reviews the nonlinear microwave device modeling technology based on Neuro-Space Mapping (Neuro-SM). We mainly introduce two kinds of Neuro-SM models: the Neuro-SM model with input mapping network and the Neuro-SM model with output mapping network. Compared with the traditional equivalent circuit model, the Neuro-SM models are more accurate. Measurement data of the RF power laterally diffuse metal-oxide semiconductor (LDMOS) transistor and InP HEMT transistor are used as the application examples to verify the reviewed two Neuro-SM models can accurately reflect the characteristics of transistors with simple operation process and enhance the accuracy of the existing model.</p>
<p>B4018 Session 3 Presentation 9 (15:30-15:45)</p>	<p>Improvement of Neuro-Space Mapping Structure Shuxia Yan, Xiaoyi Jin, Yaoqian Zhang, Weiguang Shi and Wei Xu Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—A novel Neuro-Space Mapping (Neuro-SM) modeling with capacitors and inductors is proposed. The proposed model processes the DC signal and the AC signal respectively: the AC component is mapped while the DC signal is not affected by the mapping relationship. This</p>

	<p>method can improve the AC characteristic without changing DC characteristic and match the device with a few optimization variables and simple mapping relationship. The example result confirms that the proposed Neuro-SM method can accurately reflect the characteristics of transistor with simple operation process and enhance the accuracy of the existing model.</p>
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16:00-16:15

Coffee Break



Session 4

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

Afternoon, September 20, 2018(Thursday)

Time: 16:15-18:30

Venue: No. 2 Teaching Building-Conference Room One

Session 4: Topic: “Medical Image Analysis and Clinical Application”

Session Chair: Prof. Jing Bai

<p>B0023 Session 4 Presentation 1 (16:15-16:30)</p>	<p>Effects of Daphne Giraldii Nitsche Gel Patch on Acute Gouty Arthritis Guangshan Xuan, Qi Gong, Xiaoyu Hua and Bin Li Qingdao University of Science and Technology, China</p> <p><i>Abstract</i>—The Daphne giraldii Nitsche gel patch was prepared based on optimal prescription which was obtained by permeation experiments to explore the permeation effect of borneol and azone for active ingredients of Daphne giraldii Nitsche under different proportions. The anti-acute gouty arthritis effect of Daphne giraldii Nitsche gel patch was evaluated on monosodium urate (MSU) crystal-induced inflammation in rats, an experimental model for acute gouty arthritis. Then the Anti-inflammatory and anti-oxidation effect of Daphne giraldii Nitsche gel patch was evaluated by measuring tumor necrosis factor (TNF) -α, interleukin (IL)-1β, superoxide dismutase (SOD) and malondialdehyde (MDA) of rat plasma and rat joint swelling index. Through observing the morphology of the knee and kidney in rats, the anti-acute gouty arthritis effect was further confirmed. The results show that as permeation enhancers, the optimal ratio of borneol to azone is 1:1. The Daphne giraldii Nitsche gel patch can alleviate ankle swelling degree in model rats, significantly reduce the levels of serum pro-inflammatory cytokines (TNF-α, IL-1β and MDA) and raise the activity of SOD. In conclusion, Daphne giraldii Nitsche gel patch has an anti-inflammatory effect on acute gouty arthritis and can protect kidney to some degree through morphology observation.</p>
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<p>B0046 Session 4 Presentation 2 (16:30-16:45)</p>	<p><i>K</i>-core Graph-Based Retinal Vascular Registration Mingzhe Ruan, Xingxing Ren, Guangxu Li, Philip O. Ogunbona and Jun Wu Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—Temporary subtraction method was verified as an efficient way for detecting the lesions in routine inspection. In this paper, we apply this technique in the recognition of diabetic retinopathy, and simulate the registration of fundus images of the same person captured at two different times. As the crucial step of processing, a refined correspondence of vasculatures from fundus images is proposed using graph theory. First a graph model of the vascular network is generated from the fundus image or other modalities. Second, the graph is decomposed into a <i>k</i>-core representation which should transform a dense graph into a sparse version. Finally, the key nodes which kept high <i>k</i>-core value are remained for images registration by means of Iterative Closest Point algorithm.</p>
<p>B0030 Session 4 Presentation 3 (16:45-17:00)</p>	<p>Numerical Evaluation of the Performance Efficiency of Small-Caliber Colonoscopes in Reducing Patient Pain During a Colonoscopy: Influence of Gender Xuehuan He, Jing Bai and Debao Zhou University of Minnesota Duluth, USA</p> <p><i>Abstract</i>—This paper presents the development of an insertion simulation of colonoscopes with different diameters inside colon models using ANSYS LS-DYNA. The purpose is to provide insight on the performance efficiency of small-caliber (SC) colonoscopes in reducing patient pain during a colonoscopy considering the effect of gender. In developing such a simulation, the structural differences between the female and male human colons were firstly analyzed and further used as the basis of establishing colon models. The colonic tissue was comprised of a three-parameter Mooney Rivlin model whose parameters were obtained through an optimization procedure with the use of ANSYS and Optislang programs. Colon deformation induced by colonoscopes during the insertion simulation were investigated to provide prediction of patient pain. The simulation results show that colonoscopes with smaller diameters may be helpful in reducing patient pain for females while having no or less advantage for males.</p>

<p>B1012 Session 4 Presentation 4 (17:00-17:15)</p>	<p>Semiparametric Modeling for Identifying Gene Signatures of Triple Negative Breast Cancer from Multi-Omics Data Zhenqiu Liu Penn State College of Medicine, USA</p> <p><i>Abstract</i>—Triple-negative breast cancer (TNBC) is characterized by a lack of or reduced expression of the estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2). TNBC is a heterogeneous disease, accounts for about 15% of all breast tumor cases. It usually has larger size, higher grade, higher chances of lymph node involvement and more aggressive, contributing to poor survival. Neo-adjuvant chemotherapy is the only available treatment. Biomarkers for TNBC need to be developed. We proposed a novel semiparametric model for identifying and validating gene- signatures with multi-omics data. A joint modeling approach for multi-omics data integration was also developed. Several potential gene signatures associated with TNBC or the subtypes of TNBC were identified and validated with public databases. Their functional mechanisms were also explored.</p>
<p>B1004 Session 4 Presentation 5 (17:15-17:30)</p>	<p>Application of Post-Processing Image Reconstruction Using 256-Slice CTA for Patients with Lower Extremity Fractures Xiongfeng Tang, Jianhua Liu and Yanguo Qin The Second Hospital of Jilin University, China</p> <p><i>Abstract</i>—Background: Computed tomographic angiography has been the first-line investigation for all patients with suspected vascular trauma. With the invention and evolution of multi-slice CTA, multi-slice CT angiography for vascular injury. We intend to evaluate the outcomes with 256-slice CT angiograms at our clinical orthopedic diagnosis and treatment center. Methods: A retrospective review was performed in our hospital electronic medical record system and picture archiving and communication systems between 2016 and 2017 for patient who got lower extremity trauma and performed a 256-slice CTA at any time during their hospitalization. Results: There were 17 female patients and 46 male patients with different type of injury. Among the 63 patients with CTA, 38 (60.3%) had positive CTA finding, 39.7% of them had a negative CTA findings. 11 patients got the CTA examination after surgical treatment, the rest of patients got their CTA before intervention. Only one injury patient without any soft or hard sign of vascular, meanwhile, his CTA finding is negative. Among the positive CTA findings, vascular tear on account of 84.2%, vascular narrow account for 23.6%, 10.5% shows collateral circulation and one suspected to be arteriovenous fistula. 5 multiple open fracture patients got amputation, all of them has hard and soft sign, positive CTA finding and companied with nerve injury. Conclusion: 256-slice CTA is a sensitive and non-invasive imaging</p>

	examination for vascular injury of lower extremity fracture patients.
B0015 Session 4 Presentation 6 (17:30-17:45)	<p>Direct Regularization of MRI-guided Diffuse Optical Tomographic based on L1-Norm Qiuwan Sun, Jinchao Feng, Zhe Li, Zhonghua Sun and Kebin Jia Beijing University of Technology, China</p> <p><i>Abstract</i>—Due to the high scattering and low absorption characteristics of near-infrared light in the biological medium, the image quality and spatial resolution obtained by the Diffuse Optical Tomographic (DOT) cannot meet the medical diagnosis request. In this paper, we introduce a reconstruction approach that the gray value of Magnetic Resonance Image (MRI) can be encoded into the image reconstruction process as prior information to avoid the user intervention of image segmentation and to improve the quality of the reconstructed images. Consider to the sparsity of the interest region in background, L1 norm are adopted as the regularization term. Relative to the no prior and the L2-norm regularization, the results show improvements in reconstructed accuracy and contrast.</p>
B0016 Session 4 Presentation 7 (17:45-18:00)	<p>Brain Tumor Identification Based on CNN-SVM Model Ruixuan Lang, Kebin Jia and Jinchao Feng Beijing University of Technology, China</p> <p><i>Abstract</i>—Brain tumors are one of the major diseases that threaten human life and health. Accurate diagnosis is the key to improving the therapeutic effect and saving the patient's life. Computer technology can effectively help doctors improve diagnostic accuracy. Among them, brain tumor recognition technology is a research hotspot. An integrated brain tumor recognition approach is proposed to distinguish between the benign and malignant brain tumors. This method combines the optimized CNN model with SVM to fully utilize the strengths of them. Experimental results justify the effectiveness of the proposed model.</p>
B0029 Session 4 Presentation 8 (18:00-18:15)	<p>Visualization of Time-to-Peak Changes on Cerebral Digital Subtraction Angiography for Patients Underwent Endovascular Therapy Jia-Sheng Hong, Chung-Jung Lin, Yi-Hsuan Kao, Markus Kowarschik and Ling-Hsuan Meng National Yang-Ming University, Taiwan</p> <p><i>Abstract</i>—Cerebral digital subtraction angiography (DSA) image series are routinely used for treating cerebral arterial stenosis or occlusion. The time-to-peak value is an important hemodynamic parameter for treatment planning and prognosis assessment. The endovascular therapy is a standard procedure to treat stenotic vessels. This study aims to provide a technique to evaluate the change in TTP achieved by the treatment. A registration process is applied to the two time-to-peak images of two</p>

	<p>DSA dataset acquired from the same patient, before and after the endovascular therapy. The change of TTP can be precisely calculated from the registered TTP images for every pixel. The TTP-difference image displays the hemodynamic improvement achieved by the treatment procedure. This image can assist the physicians to evaluate the effectiveness of the treatment visually and quantitatively.</p>
<p>B0020 Session 4 Presentation 9 (18:15-18:30)</p>	<p>Research on Magnetic Detection Electrical Impedance Tomography System Based on Scanning Platform Ruijuan Chen, Bingnan Li, Fang Li, Huiquan Wang and Jinhai Wang Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—The purpose of this research is to design and build a data acquisition system for magnetic detection electrical impedance tomography, optimize the weak magnetic field detection method and improve the detection accuracy, provide the measured magnetic flux density data to test the conductivity reconstruction algorithm and apply this system to detect the anomaly in an object. The measurement system is divided into hardware module and software module. First, the overall diagram of the system is given, and then each component of hardware is explained. The software is developed in the LabVIEW environment. The various parameters are easily modified by the control panel, and the experimental data is obtained and stored automatically by the software. The system's acquisition resolution can reach 10^{-9}T according to the verification, which meets the needs of use in biomedical signal measurement. In order to verify the feasibility of the system, a phantom experiment was conducted. By applying the reconstruction algorithm to the acquired data for reconstruction, the distribution of the anomaly can be clearly distinguished based on the reconstructed conductivity distribution map, the experiment shows that the system is practical and feasible.</p>

Session 5

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

Afternoon, September 20, 2018 (Thursday)

Time: 16:15-18:30

Venue: No. 2 Teaching Building-Conference Room Two

Session 5: Topic: “Communication and Signal Processing”

Session Chair: Dr. Peng Wei

<p>B3017 Session 5 Presentation 1 (16:15-16:30)</p>	<p>Analysis and Simulation of Antenna Mast Fast Motion in Spaceborne Dual-Antenna InSAR System Shun Li, Anxi Yu, ZaoYu Sun and Xiaoxiang Zhu National University of Defense Technology, China</p> <p><i>Abstract</i>—Spaceborne dual-antenna uses satellite as platform, and the satellite center extends two antennas to both sides at the same time. The first antenna transmitting and receiving antenna while the second antenna is installed the other end. The antenna arm is used to form an interferometric baseline. Synthetic aperture radar (SAR) interferometry is achieved by using antennas at both ends of antenna arm transmitting and receiving signals. Comparing with SRTM system [1] [2], which extends a 60-meter antenna arm to form an interference baseline for interferometry, the new system will have better performance. But during the flight, the attitude adjustment of the engine will cause the antenna mast motion, which will affect the SAR imaging and interferometry. The relatively regular slow motion can be compensated, but the fast motion is difficult to measure because of randomness. So we should analysis the effect of fast antenna mast motion in this system. In this paper, the amplitude and frequency threshold model of the antenna fast mast motion in dual-antenna SAR system is proposed by theoretical derivation. At the same time, the accuracy of the theoretical analysis is verified by the simulation experiment of the whole process, which provides theoretical support for design of dual-antenna system.</p>
<p>B3018 Session 5 Presentation 2</p>	<p>Near-Field Antenna Pattern Optimization with Thinned Array Based on Genetic Algorithm Chen Tao, Jin Guanghu and Dong Zhen National University of Defense Technology, China</p>

(16:30-16:45)	<p><i>Abstract</i>—Thinned arrays have advantages of achieving low sidelobe with fewer array elements than the full array. The far-field plane wave assumption commonly used in arrays is no longer valid in the situation of radar imaging. With considering the near-field spherical wave effect, this paper utilizes the genetic algorithm to thin the arrays. Radar images of objects are then obtained with the thinned array. Firstly, the pattern formation of antenna array in the near field is discussed. Secondly, we use the genetic algorithm to optimize the selected elements from a full array to achieve a thinned array under the circumstance of the near field. Lastly, radar imaging with the thinned array is compared with the situation of full array. Simulation and RADBASE data processing showed that our proposal has good performance.</p>
<p>B4033 Session 5 Presentation 3 (16:45-17:00)</p>	<p>Efficient Resource Allocation for D2D Communication Underlying Cellular Networks: A Multi-round Combinatorial Double Auction Jianbin Xue, Qing Ma and Hua Shao Lanzhou University of Technology, China</p> <p><i>Abstract</i>—Device-to-Device (D2D) communication brings significant benefits to spectrum utilization, increasing throughput of the system and extending the coverage of cellular networks, it also causes interference to the cellular networks as a result of spectrum sharing. In this paper, energy efficiency is considered as the optimization objective since the devices are handheld equipment with limited battery life. Power control for D2D user transmitting terminal is presented to reduce system power consumption and match the appropriate resource packages. To optimize the energy efficiency over the resource allocation, we formulate the allocation problem as a multi-round combinatorial double auction (MCDA) algorithm. The simulation results demonstrate that the algorithm enhances the system energy efficiency and ensures the fairness of resource allocation.</p>
<p>B4036 Session 5 Presentation 4 (17:00-17:15)</p>	<p>Resource Allocation for System Throughput Maximization Based on Mobile Edge Computing Jianbin Xue, Hua Shao and Qing Ma Lanzhou University of Technology, China</p> <p><i>Abstract</i>—Mobile edge computing (MEC) provides cloud computing capabilities at the edge of the mobile network, emphasizing proximity to mobile users to reduce network operation and service delays, improving user experience. In this paper, we study the problem of low utilization spectrum resources for MEC in 5G heterogeneous networks. We first explore the problem of computing offloading in multi-channel environment. Then an optimization problem is proposed to maximum the overall throughput of the offloading system, where the power control and interference are taken into consideration. We transform the original</p>

	<p>optimization problem into a convex optimization problem, and use the Lagrangian dual algorithm to establish the KKT condition. By continuous iterative operation, the user's transmit power is optimally achieved. Simulation results show that our proposed scheme not only guarantees the communication quality, but also improves the system throughput and spectrum utilization.</p>
<p>B3020 Session 5 Presentation 5 (17:15-17:30)</p>	<p>Environmental Noise Classification Using Convolution Neural Networks Li Mengyuan, Gao Zhenbin, Zang Xinzhe and Wang Xia Hebei University of Technology, China</p> <p><i>Abstract</i>—In order to achieve automatic analysis of environmental noise and related data, a method for classifying noise based on a convolutional neural network (CNN) model was proposed. First, the time-frequency conversion of the noise signal is performed by Short-Time Fourier Transform (STFT), and then the Log Mel-Frequency Spectral Coefficients (MFSCs) of the noise signal are extracted. Finally, the noise-established CNN model is classified. The whole system is implemented on tensorflow. The experimental results show that this method can obtain better classification results, which proves that this method has certain practicability.</p>
<p>B3023 Session 5 Presentation 6 (17:30-17:45)</p>	<p>Efficient Transmission Scheme for Distributed Signal Detection with Noisy Communication Links Xiangyang Liu, Yu Cong, Jian Yang National University of Defense Technology, China</p> <p><i>Abstract</i>—We consider the problem of distributed signal detection in a wireless radar sensor network with sensors having non-ideal communication links to the fusion center. Other than the research of the optimum detection scheme, we focus on the efficient transmission of given sensor decisions at the cost of slightly lowering the detection probability at the fusion center. To do so, we introduced two quantities, i.e., detection probability loss coefficient and communication gain coefficient. By studying their curve, an efficient transmission scheme can be found with detection probability loss less than a prescribed small value. A procedure was given, and the simulation results illustrated the effectiveness of the proposed method.</p>
<p>B4035 Session 5 Presentation 7 (17:45-18:00)</p>	<p>On the Robustness of Covariance Matrix Shrinkage-Based Robust Adaptive Beamforming Zhitao Xiao, Jiahao Wang, Lei Geng, Fang Zhang and Jun Tong Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—Beamforming has been widely studied in wireless communications, radar, sonar, and other array systems. Digital beamforming is usually designed based on the array response and the</p>

	<p>estimation of the covariance matrix of the received signal. Various model mismatch issues can arise due to unequal antenna gains, phase errors, direction-of-arrival (DOA) mismatch and imperfect estimation of the covariance matrix. Different methods based on the shrinkage estimation of the covariance matrix and interference-plus-noise covariance matrix reconstruction have been proposed to address the challenges. In this paper, we investigate the robustness of several approaches in the presence of model uncertainties. We demonstrate the pros and cons of those approaches under different scenarios, based on which recommendation on the choice of the proper method may be made.</p>
<p>B3009 Session 5 Presentation 8 (18:00-18:15)</p>	<p>Optimized Variable Size Windowing Based Speaker Verification Sujiya Sreedharan and Chandra Eswaran Bharathiar University, India</p> <p><i>Abstract</i>—In recent years the variances of speech features of speaker verification system were measured by computing covariance matrix parameterized through its eigenvalues and vectors by keeping fixed sliding window size. The computed eigenvectors were weighted with its corresponding magnitude and normalized. Then, the features were extracted and fused using different fusion techniques for recognizing the speaker. However, this approach was not suitable for all types of datasets and some significant feature information may be lost during extraction based on fixed window size. Hence in this article, the variable size sliding window is applied for Speaker Verification system. Initially, the speech signal is considered as input and the FMPM features are extracted using FDLP, MHEC and PNCC including MFCC based on the variable size of a sliding window. Here, the sliding window size is optimized by Modified Grey Wolf Optimization (MGWO) algorithm which is also used for selecting the classifier parameters and most optimal features adaptively. The most optimal features are selected from the extracted FMPM and classified by using GMM classification. Thus, the proposed approach allows continuous adaptation of SV using variable window size and classifier parameters. Finally, the considerable improvements in Speaker Verification are observed through experimental results.</p>
<p>B3010 Session 5 Presentation 9 (18:15-18:30)</p>	<p>An Advance on Gender Classification by Information Preserving Features Karthika Kuppusamy and Chandra Eswaran Bharathiar University, India</p> <p><i>Abstract</i>—One of the most challenging issues in Speaker's Gender Classification (SGC) is feature extraction. Since, it degrades the classification accuracy due to information loss during features extraction using speech signals. In previous researches, Perceptual Linear Prediction (PLP) coefficients were extracted by using Blackman</p>

windowing method along with the other features of speech signal to improve the classification accuracy. However, still some information was lost at those window edges which degrade the recognition accuracy and also more efficient features were required to improve the classification performance. Hence in this paper, SGC is improved by extracting the PLP coefficients based on novel windowing technique. In this technique, initially type-1 features such as spectral and prosodic features of speech signal are extracted. In addition, Information Preserving Perceptual Linear Prediction (IPPLP) coefficients are also extracted using Slepian windowing method. Moreover, the frequency-dependent transmission characteristics of the outer ear are compensated based on the analysis of time-varying Equal Loudness Contour (ELC) curves and Peak-to-Loudness Ratio (PLR). After that, the extracted IPPLP features are fused with type-1 features and classified by using different combinations of classifiers like Gaussian Mixture Model (GMM), Support Vector Machine (SVM) and GMM supervectors-based SVM at score level fusion scheme. According to the final classification result, the type of speaker's gender is recognized. Finally, the experimental results show the significant improvements on classification accuracy by using proposed classification technique. With the proposed speaker's gender classification technique, the classification accuracy values are obtained 38.55%, 62.65% and 69.88% in GMM, SVM and GMM-SVM classification, respectively.

Session 6

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

Afternoon, September 20, 2018 (Thursday)

Time: 16:15-18:45

Venue: No. 2 Teaching Building-Conference Room Four

Session 6: Topic: “Power System and Electrical Engineering”

Session Chair: Assoc. Prof. Shengwei Gao

<p>B3004 Session 6 Presentation 1 (16:15-16:30)</p>	<p>Inrush Current Suppression of High Voltage Shunt Capacitors Based on Precharge Chen Xingtong, Deng Zhanfeng and Hao Jianhong North China Electric Power University, China</p> <p><i>Abstract</i>—When a circuit breaker switch on high voltage shunt capacitors, heavy inrush current will occur and harm the power system and some electrical devices. This paper proposes a precharge strategy to suppress the inrush current caused by capacitor switching on. The precharge strategy is used to charge a single-phase capacitor to the target value before the circuit breaker closing three phase circuit synchronously. The target value of precharge is obtained by the theoretical derivation, and a topology of precharge device is put forward based on the target value. This paper build a PSCAD simulation model to validate the proposed precharge strategy, the closing time scatter of the vacuum circuit breaker is taken into consideration as well. The simulation results show that the inrush current can be limited under 1.6p.u., closing current peaks of three phases are decreased to 0.33 times, 0.6 times and 0.5 times of the original current peaks, and the duration time of closing transient is sharply shortened. Thereby validate the proposed precharge strategy can effectively suppress the inrush current of high voltage shunt capacitors.</p>
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<p>B4002</p> <p>Session 6</p> <p>Presentation 2</p> <p>(16:30-16:45)</p>	<p>TWACS and the Solutions for Modern Distribution Network Xuegui Ren, Li Ju and Qing Fang State Grid Beijing Economic Research Institute, China</p> <p><i>Abstract</i>—Recently, the monitoring service for important users in the distribution network is relatively insufficient in China, which greatly influences the efficiency of power distribution. According to the requirement of optimizing operation control in modern distribution network, a Two Way Automatic Communication System (TWACS) for the transmission of monitoring data is designed in this paper. The vital issues pertaining to distribution automation in the light of the TWACS communication technology are presented and discussed. In accordance with transmission demand and channel characteristics of modern distribution network, it adopts double zero-crossing points modulation method to improve downlink communication speed, which combines Gaussian window function and matched filtering way to restrain high-frequency interference. Meanwhile, distributed uplink receiving methods and orthogonal vector reuse are used to identify the topology structure of modern distribution network which provides the basis for power flow analysis in modern distribution network. Finally, the example analyzing how to carry on topology structure of the distribution network by TWACS shows the effectiveness of this algorithm.</p>
<p>B4004</p> <p>Session 6</p> <p>Presentation 3</p> <p>(16:45-17:00)</p>	<p>Fault Location and Design of On-line Monitoring System for Voltage Sag Chong Liu, Lijun Tian, Yanwen Hou and Yunxing Gao Shandong University, China</p> <p><i>Abstract</i>—In modern power systems, the methods of voltage sag monitors optimal placement and fault assessment are based on fixed threshold detection system, which affect the method's accuracy. To change this limitation, an active information extraction on-line monitoring system for voltage sag is developed. The monitor is based on STM32 microcontroller chip, using GPRS to communicate with the host computer. A new monitor reach area method considering fault location is proposed. LabVIEW is used to build servers. The host computer uses a new fault location method to analyze the uploaded information. The simulation results show that the new design of the system can accurately locate the fault location and evaluate the voltage sag state of the network.</p>
<p>B4005</p> <p>Session 6</p> <p>Presentation 4</p> <p>(17:00-17:15)</p>	<p>Power Quality Comprehensive Evaluation of DC Distribution Network Based on Maximizing Deviation and Fuzzy Matter-Element Model Haixia Lv, Lijun Tian and Zhiguo Wang Shandong University, China</p> <p><i>Abstract</i>—A At present, DC supply technology has become a research</p>

	<p>hotspot again. And the wide application of all-controlling power electronics devices also makes DC distribution system usher in a new opportunity for development. Through the analysis of the possible power quality problems existing in DC power distribution network, a set of comprehensive evaluating method for DC power quality is proposed in this paper. To avoid the excessive subjectivity or objectivity of weight coefficients, the combination weighting method based on maximizing deviation is adopted to allocate the subjective and objective weight proportion fairly, thus making the decision of comprehensive weights more accurate. Fuzzy matter-element model is built to evaluate power quality of DC distribution network in order to solve the problems in DC power quality evaluation process, such as fuzziness and uncertainty. Finally, numerical examples show that the proposed comprehensive evaluation model can be used to evaluate DC power quality with feasible and practicability results.</p>
<p>B4006 Session 6 Presentation 5 (17:15-17:30)</p>	<p>A Fuzzy Comprehensive Evaluation Model of Power Quality based on Normal Cloud Model Cheng Lv, Lijun Tian and Zhiguo Wang Shandong University, China</p> <p><i>Abstract</i>—Objective and accurate comprehensive evaluation on power quality is an important evidence for power pricing and power quality assessment. Considering the shortcomings existing in the current methods, a fuzzy comprehensive evaluation model of power quality based on normal cloud model is proposed. The normal cloud model is introduced to improve the membership function, and the normal cloud models on grade demarcation of power quality are established so that the fuzzy relation matrix is obtained. Entropy weight method is used to determine the weight of the evaluation indicators. In order to get the comprehensive evaluation grade of power quality, the unsymmetrical proximity criterion is used to analyze the fuzzy comprehensive vector which calculated by weight matrix and the fuzzy relation matrix. Finally, the accuracy and effectiveness of the proposed method are verified by a practical example.</p>
<p>B4010 Session 6 Presentation 6 (17:30-17:45)</p>	<p>Clustering Residential Electricity Consumption: A Case Study Samuel Bimenyimana, Godwin Norensa Osarumwense Asemota, Paula Jeanne Ihirwe and Lingling Li Hebei University of Technology, China</p> <p><i>Abstract</i>—Electricity is a crucial need of any modern society for improved lifestyle. Rwanda is a fast growing economy country, with some electricity access rolling out programmes and the country is trying its best to improve the national power grid infrastructure to meets its population power demand and enhance quality of life. Macroeconomic data of expenses on annual electricity consumption from EICV 4 (EICV:</p>

	<p>Enquête Intégrale sur les Conditions de Vie des ménages (French), Integrated Household and Living Conditions Survey (English)) from National Institute of Statistics of Rwanda (NISR), and price of electricity for residential customers, comprising dataset of 2311 surveyed residential dwellings were clustered by their annual electricity consumption between October 2013 and October 2014 into three groups. Statistical Package for Social Sciences (SPSS version 20), K-means clustering algorithm and Excel Data Analyses Tool results reveal that: (a) 60.2 kWh was the annual electricity consumption per person nationwide, (b) 3395 kWh (dwelling of 5 people) was the highest annual electricity consumption (Huye district, Southern Province), (c) 9.7 kWh (dwelling of 6 occupants) was lowest annual electricity consumption (Bugesera District, Eastern Province), and (d) 278.7 kWh was the average kWh annual energy consumption. K-means clustering algorithm reveals that 93.2% of surveyed dwellings annual electricity consumption was between 9.7 and 582.1 kWh.</p>
<p>B4015 Session 6 Presentation 7 (17:45-18:00)</p>	<p>Study on the Control of Phase Shift Closed-Loop Bi-Directional Full-Bridge DC-DC Converter Shengwei Gao, Shuling Qi, Xiaoming Liu, Jia Su and Xu Li Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—Under the traditional single-phase-shift control, the transmission efficiency of isolated bi-directional full-bridge DC-DC converter under closed-loop control is relatively low. Therefore, a design scheme of closed-loop bi-directional full-bridge DC-DC converter based on small-signal model is proposed. The structure and single-shift control principle and open-loop characteristics of bi-directional full-bridge DC-DC converter are analyzed. Based on the state space averaging method, a mathematical model of closed-loop control of small-signal model is established. The simulation model with phase-shifted full-bridge converter as the core is built on Matlab software. Finally, the closed-loop control result graph of small-signal model of bidirectional full-bridge DC-DC converter is given. And based on the DSP28355 chip, the experimental system was built. The results show that the transmission efficiency of the closed-loop control bidirectional full-bridge DC-DC converter with small signal model reaches 98.5%, which verifies the correctness of the control scheme.</p>
<p>B4017 Session 6 Presentation 8 (18:00-18:15)</p>	<p>Research of Silicon Carbide LLC Resonant Converter in Electric Vehicle Charging System Shengwei Gao, Xiaoming Liu, Xin Lu, Xu Li and Jia Su Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—The development of charging system for high power density electric vehicle is of vital importance to the development of the new</p>

	<p>generation of high-power electric vehicles. First, a soft-switching DC/DC resonant converter in Electric Vehicle is proposed, which is based respectively on silicon carbide and silicon power devices. The output power of the converter is 3.3kW, and the highest efficiency of the system can reach 98.26%. Then, the problem of parasitic inductance in Silicon Carbide devices under high frequency is analyzed, and the solution is provided. Finally, conclusions comes that the DC/DC resonant converter using SiC power devices is of lower power loss, higher system efficiency, and higher power density, which is surely favorable for the performance and efficiency of electric vehicle charging system.</p>
<p>B4007 Session 6 Presentation 9 (18:15-18:30)</p>	<p>An Online Power System Dynamics Prediction Based on Deep Neural Network Bin Zhang, Jian Han, Yanlin Ren, Huimin Wen, Ziyue Song, Qirui Gan, Ran Wei, Bin Zhou and Xin Dang Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—Building Power analysis has drawn more and more attention in recent years. In this paper, we present a system for online power prediction for the public building. It is based on a 4-layers Deep Neural Network that use architectural metrics of the physical machines collected dynamically by our system to predict the physical machine power consumption. A real implementation of our system shows that the prediction accuracy could reach 76.50%.</p>
<p>B3014 Session 6 Presentation 10 (18:30-18:45)</p>	<p>A RFID-based Temperature Measurement System for Smart Substation Yiyang Zhang, Fei Liu, Haoyuan Pang, Xiangzhen Li Zhu Liu and Yeshen He Tianjin University of Science & Technology, Tianjin, China</p> <p><i>Abstract</i>—The power load of the high-voltage electrical equipment in the smart grid, such as transformers, switchgear and loop cabinet, has increased dramatically. As the connection point between equipment and equipment is the weakest link in power transmission, and the essence problem of this weak link is the heat at the junction point. As the load increases, the joints heat up and form a vicious cycle: temperature rise, expansion, contraction, oxidation, increasing resistance, heating up again until the accident occurs. In this paper, the on-line temperature monitoring system based on RFID is designed. Through sensing technology, digital recognition technology, wireless communication technology, low power technology, anti-interference technology and automatic control technology, the real-time on-line monitoring of the temperature of the equipment is realized. The problem of SAW temperature measurement and the same frequency misreading and the interference of SAW temperature measurement are completely solved as well as the problem of changing and mistakenly warning. The utility</p>

	<p>model can be widely applied to temperature monitoring of various high and low voltage switchgear, box type changing and ring network cabinets, and can be installed on new equipment, or can be retrofit on old equipment.</p>
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Poster Session

September 20, 2018 (Thursday)

Time: 13:30-18:45

Venue: No. 2 Teaching Building

<p>B0041 Poster 1</p>	<p>Live Cell Imaging for Monitoring the Specific Cytotoxicity of LMP2-Specific Cytotoxic T Lymphocytes Induced by rAd-LMP2 Vaccine Yu-Yang Ge, Xiao-Li Wang, Zhi-Xiang Zhou, Zhi-Ping Teng and Yi Zeng Beijing University of Technology, China</p> <p><i>Abstract</i>—Treatment of nasopharyngeal carcinoma (NPC) with EBV-LMP2 specific cytotoxic T lymphocytes (CTLs) has been proved as a successful immunotherapeutic treatment strategy. However, the cellular immunotherapy is only effective on partial patients with NPC in clinic and conventional methods cannot truly reflect the specific cytotoxicity of CTLs. Hence, a newly technique is needed to elucidate the specific cytotoxic functions of LMP2-specific CTLs. We utilize live cell imaging technique to dynamically monitor the specific cytotoxicity of LMP2-specific CTLs. In this study, magnetic bead sorting method was used to enrich CD8+T cells from spleen lymphocytes of BALB/c mice immunized with rAd-LMP2 vaccine. The frequency of LMP2-specific CTLs in purified CD8+T cells was analyzed by flow cytometry. Purified CD8+T cells and target cells expressing EBV-LMP2 protein were mixed with an E: T ratio of 10:1. And then, LMP2-specific CTL-mediated cytotoxicity was dynamically monitored using live cell imaging. As a result, we found that LMP2-specific CD8+T cells could recognize and kill the target cells specifically and rapidly. In conclusion, live cell imaging can be applicable to elucidate the specific cytotoxicity of LMP2-specific CTLs for the research for cellular immunotherapy of EBV-associated tumors.</p>
<p>B1002 Poster 2</p>	<p>Effects Induced by Movement Training and Soy Polypeptide Supplement on D-Galactose Rat Model of Skeletal Muscle Aging Fengbin Liu Dalian University, China</p> <p><i>Abstract</i>—Purpose: This study was designed to investigate the effects and possible molecular mechanism exerted by resistance training and soy polypeptide supplement treatments in a model of rat skeletal muscle</p>

	<p>aging induced by D-galactose injection. Methods: Sixty, 3-month-old, male SD rats were randomly assigned to different groups: control group, six weeks model group, twelve weeks model group, small load exercise group, big load exercise group, peptide group, peptide and big load exercise group, peptide and small load exercise group. Moreover, eight 14-month-old rats were used as natural aging group. Results: Typical signals of skeletal muscle aging were observed in established rat model, such as muscle fiber atrophy or degenerative changes like circular muscle fibers and centralized nucleus. Significant changes were also observed in body weight, gastrocnemius muscle weight, and mRNA expression of α-actin and myosin heavy chain isoforms in rat skeletal muscles. Conclusion: The subcutaneous injection of D-galactose for six weeks successfully induced skeletal aging rat model. The following six-week treatment with resistance training and soy polypeptide supplement can effectively interfere in the aging process of rat skeletal muscle, inducing significant changes at the molecular level.</p>
<p>B0034 Poster 3</p>	<p>Assessment of Nakagami Parameters of Ultrasonic Harmonic Envelopes for Noninvasive Microwave Ablation Monitoring Hong-xuan Zhu, Yu-feng Zhang, Yu-qian Wang, Jie-Cheng Yunnan University, China</p> <p><i>Abstract</i>—Microwave ablation (MWA) is an important means for tumor therapy. The nonlinearity of biological tissue is increased with an increase of the temperature in the ablation process. Based on this characteristic, the tissue ablated by microwave could be monitored using the quantitative parameters related to second-harmonic ultrasonic envelope (SHUE) signals. In the present study, the variations in the Nakagami parameters (NPs) of SHUE signals echoed from tissues with different nonlinear coefficients are investigated, and employed for noninvasive MWA monitoring. Ultrasonic radio frequency (RF) echo signals based on different values are simulated using the nonlinear RF ultrasound simulator CREANUIS to comparatively evaluate the variations of NPs from the fundamental and second-harmonic echo envelopes with different values of. The results show that the NPs of the fundamental envelope signals are aliasing. By contrast, the NPs of the second-harmonic envelopes are separated and increase with increasing. Moreover, the SHUE signals are obtained from water bath heating experiment. Afterwards, the spectral of second-harmonic RF signals and statistical histograms of the corresponding SHUE signals are computed. The results exhibit that the NPs of SHUE signals, which reflect the degree of nonlinearity of the heated liver tissues, increase with increasing water bath temperature. In conclusion, the SHUE-based NPs are sensitive to the tissue nonlinearity. By considering this characteristic, the ablated tissue can be monitored accurately and effectively with the NPs of SHUE signals.</p>

<p>B0040 Poster 4</p>	<p>A Comparison of Ultrasound-Based QA and ln(D)U Methods for Measurement Local Pulse Wave Velocity Wei-Jia Zhao, Yu-Feng Zhang, Bing-Bing He and Gui-Ling Qi Yunnan University, China</p> <p><i>Abstract</i>—The pulse wave velocity (PWV) is directly related to the elastic modulus, and can accurately reflect the degree of stiffness. In this study, we compare two single-location methods to locally estimate PWV based on simultaneous measurements of velocity (U) and arterial diameter (D): the QA-loop and ln(D)U-loop. The performance of these two methods is analyzed using an ultrasound simulation model of a female’s carotid artery with FIELD II platform. The results based on 30 simulations show that the normalized root-mean-square-errors of estimated PWVs based on QA and ln(D)U methods are 0.30 ± 0.08 and 0.45 ± 0.13, respectively. The QA method is found to correlate well with the ln(D)U method ($R^2=0.93$, $p<0.001$). These results indicate that the two methods should be capable of distinguishing between changes to PWV caused by cardiovascular diseases. And the QA method offers higher precision to the ln(D)U method for estimating local PWV.</p>
<p>B0026 Poster 5</p>	<p>A Novel Rule-Writing for Pedigree Data and Its Web-Based Drawing Tool Ye Chen and Xiaoping Yuan University of Mining and Technology, China</p> <p><i>Abstract</i>—In this paper, a novel rule-writing for pedigree data is proposed. It makes individual information easier for users to read and it also reduces pedigree file size. This paper also proposes a novel web-based tool, PedigreeOnline. In accordance with the rules, this tool is designed to assist researchers in the analysis and storage of pedigree data. This web-based tool is able to generate, edit and draw pedigrees. The tool also incorporates a function that generates the pedigree text file from the family CSV file.</p>
<p>B0032 Poster 6</p>	<p>A Selective Under-Sampling based Bagging SVM for Imbalanced Data Learning in Biomedical Event Trigger Recognition Yifei Chen Nanjing Audit University, China</p> <p><i>Abstract</i>—Because of the importance of the biomedical events in understanding the biomedical processes and functions, extraction of events from biomedical literature automatically becomes the recent research focus, which can update the existing biomedical knowledge faster. Recognition of trigger words is a very important first step for event extraction, since the following extraction steps depends on the outputting trigger words. The application of event trigger recognition</p>

	<p>aims to classify different kinds of trigger words from very large biomedical literature data sets with significant imbalance between classes. However, many existing classification methods show great limitations and performance decline on imbalanced and large data sets. In this paper, a selective under-sampling based bagging Support Vector Machine, SUS Bagging-SVM, approach has been proposed to address the issues together in an ensemble learning framework. Through making use of boundary information, a novel selective under-sampling method was designed to prune unimportant instances from the majority class to reduce imbalance in large data sets effectively. SUS Bagging-SVM was tested on the corpus of BioNLP'09 shared task. It achieved a total F1-measure of 66.1, which is competitive in comparison with other state-of-art trigger recognition systems, and a higher recall value. In conclusion, SUS Bagging-SVM is a valuable method for alleviating the problem of classification on imbalanced and large data.</p>
<p>B0036 Poster 7</p>	<p>Temporal Action Detection with Long Action Seam Mechanism Yiheng Cai, Xinran Kong and Xueyan Wang Beijing University of Technology, China</p> <p><i>Abstract</i>—Temporal action detection is a hot topic in action recognition field recently. In this paper, we propose a novel framework which can extract action segments from untrimmed videos, meanwhile predict the action category. In generally, we introduce a cascaded pipeline that could address temporal boundary at first, included feature extraction and temporal proposal model. Then, all video clips obtained above are sent to the action category classifier to detect action class. Furthermore, since that various action lengths result in inaccurate accuracy, especially on long action clip. We targeted present a novel long action seam mechanism dealing with the inaccurate location of long action. Therefore, our method is more sensitive to long action boundaries, the long action seam mechanism improves the performance of our algorithm obviously. Our algorithm performs improved accuracy by increasing mAP from 25.6 to 25.9 at threshold 0.5, on standard temporal action detection dataset, THUMOS14. it is indicated that our algorithm has particularly outstanding performance on long action detection.</p>
<p>B0037 Poster 8</p>	<p>3D Human Pose Estimation from RGB+D Images with Convolutional Neural Networks Yiheng Cai, Xueyan Wang and Xinran Kong Beijing University of Technology, China</p> <p><i>Abstract</i>—In this paper, we explore 3D human pose estimation on the RGB+D images. While many researchers try to directly predict 3D pose from single RGB image, we propose a simple framework that could predict 3D pose predictions with the RGB image and depth image. Our</p>

	<p>approach is based on two aspects. On the one hand, we predicted accurate 2D joint locations from RGB image by applying the stacked hourglass networks based on the improved residual architecture. On the other hand, in view of obtained 2D joint locations, we could estimate 3D pose with the depth after calculating depth image patches. In generally, compared with the state-of-the-art approaches, our model achieves signification improvement on benchmark dataset.</p>
<p>B1014 Poster 9</p>	<p>Applying Machine Learning in Cancer Prognosis Using Expression Profiles of Candidate Genes Danzhen Fu, Zijian Cheng and Jiahao Ding China University of Geosciences(Wuhan), China</p> <p><i>Abstract</i>—Cancer progression is a dynamic process that involves a wide spectrum of changes in expression levels for multiple genes. Increasing amount of data has been collected for patients, such as genome, transcriptome, prognosis, and histology images of the tumor. While previous studies have used mostly mutation profiles miRNA and ctRNA for cancer prognosis, we are interested in evaluating the use of expression levels of candidate genes in cancer prognosis. We used gene expression of 45 candidate genes in breast cancer as an example and showed the effectiveness of using such multivariate expression data in cancer prognosis to predict 5-year survivorship. Applying machine learning techniques, we were able to predict survivorship from expression data alone without incorporating any other information. Our example study urges such expression data to be collected for patients by hospitals, research institutes in the future.</p>
<p>B1001 Poster 10</p>	<p>Increased Functional Connectivity After Acupuncture Treatment for Patients with Post-Stroke Depression Hongbo Chen, Lin Fan, Wenyu Jiang and Yueqiang Hu Guilin University of Electronic Technology, China</p> <p><i>Abstract</i>—This study is to investigate the therapeutic effect of acupuncture treatment (ACT) on PSD through resting state functional connectivity analysis. The participants include seven PSD patients who have completed ACT trial and seven PSD patients who have completed the control trial. The resting-state functional connectivity patterns between the automated anatomical labeling brain regions were used to reveal the neuroimaging evidence for PSD with ACT. A two-factor mixed experimental design was adopted to investigate the interaction effect of acupuncture on PSD. The functional connectivity was increased in PSD patients after ACT but decreased in those without ACT after 3 weeks. The brain regions such as the right orbit middle frontal gyrus, paracentral lobule, right medial superior frontal gyrus, left angular gyrus, left anterior cingulate gyrus, and right supramarginal gyrus were related</p>

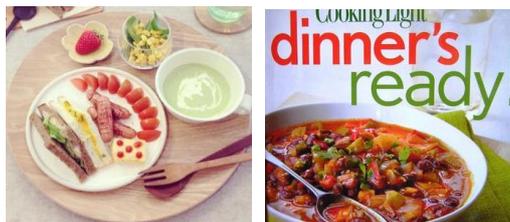
	<p>to sensorimotor and working memory. Significantly increased functional connectivity was found in PSD patients after ACT but not in those without ACT. ACT can enhance the functional connectivity in the brain. The results indicate that the sensorimotor and working memory of PSD patients is improved.</p>
<p>B0009 Poster 11</p>	<p>Drug-Target Interaction Prediction Based on Heterogeneous Networks Yingjie Wang, Huiyou Chang, Jihong Wang and Yue Shi Sun Yat-Sen University, China</p> <p><i>Abstract</i>—Predicting drug-target interactions has gradually become a heated issue in medical research. However, identifying the drug-target interactions in clinical trials requires a lot of financial resources and time. More and more computational methods are currently used for drug-target interaction predictions. This paper proposes a drug-target interaction prediction method that can integrate information from different heterogeneous networks. This method constructs multiple drug and target similarity networks and applies the GraRep algorithm on the similarity networks after denoising in order to extract the features. Features obtained from heterogeneous networks are combined as a feature vector of DTIs, which is the input of Random Forest. The result of our experiment shows that our method in this paper increases the accuracy of prediction for DTIs, which is superior to other state-of-the-art approaches.</p>
<p>B0012 Poster 12</p>	<p>Hepatoprotective Effects of Novel Cultivated <i>Antrodia Cinnamomea</i> Hong-Ying Hsiao and Yih-Ming Weng National Chiayi University, Taiwan</p> <p><i>Abstract</i>—<i>Antrodia cinnamomea</i> (AC) is a basidiomycete native only to Taiwan and the relatively rare natural source in the forest makes this fungus very expensive. In order to provide alternative sources of AC, a patent pending novel method for AC cultivation and a novel bioactive component extraction protocol were introduced in the present study. The hepatoprotective activity was tested to confirm the functionality of this novel cultivated AC. The results showed that the extract prepared from this AC could effectively protect against the liver damage caused by CCl₄.</p>
<p>B0013 Poster 13</p>	<p>A Comparative Study on the Generalization Ability of Back Propagation Neural Network and Support Vector Machine for Tracking Tumor Motion in Radiotherapy Guoping Shan, Jie Zhang, Ming Chen and Yun Ge Zhejiang Cancer Hospital, China</p> <p><i>Abstract</i>—Purpose: To compare the generalization ability of back propagation neural network (BPNN) and support vector machine (SVM)</p>

	<p>in predicting tumor motion. The generalization ability refers to the good prediction on the new data that don't appear in the modeling phase. Methods: The comparison included two aspects: precision and real-time capability. BPNN and SVR were both applied on the same bi-modal liver motion data which were shared on a website. The data consist of target motion and three external skin markers' motion. To simulate the different motion traces in modeling phase and predicting phase, the data of first 2-minute session were used to build the model and used the remaining session for validation. Because the data in the first 2-minute session were collected when the subject breathed freely and the rest contained breathing artefacts. Results: BPNN has a lower root-mean-square error (RMSE) and a lower average prediction time than SVM. Conclusion: In tracking a respiration-induced moving target, BPNN has a better generalization ability than SVM.</p>
<p>B0019 Poster 14</p>	<p>Progress of Animal Behavior Studies with Optical Motion Capture System Yingpu Bi and Lei Wu National University of Defense Technology, China</p> <p><i>Abstract</i>—In this article, we introduce the optical motion capture system and its application in animal behavior research, and track its development direction. Optical motion capture system has only been in existence for decades, but it has developed very rapidly. By virtue of its own advantages, it provides a new perspective in the study of animal behavior. It can allow biologists to obtain more specific details of animal movements, and can also establish links between human diseases and animal models. Combined with modern computer technology, optical motion capture systems will play a greater role in animal behavior research.</p>
<p>B4014 Poster 15</p>	<p>Design of Microbial Power Generation and Energy Storage System Yang Yang, Lei Wang, Yuanqi Wang, Yihong Li and Hao Song Hainan University, China</p> <p><i>Abstract</i>—Microbial power generation is the use of microbial energy to generate electricity. This paper is mainly designed to study the microbial power generation system in the energy storage system. Microbial power generation voltage is only 0.6v and this voltage is very small, The electricity from the microbes is first charged by a group of parallel super capacitors. Then the super capacitor is transformed into a series state, and then through the DC-DC boost circuit to store electricity. This can store electricity exponentially and long time power supply for load. this process, the switching of the series and parallel state of the super capacitor is controlled by a single cylinder which is connected with the circuit. The whole system can raise the voltage of microbes from 0.6V to</p>

	<p>15V. In addition, the energy storage scheme discussed in this paper has practical guiding significance, and can guide the production of the corresponding objects.</p>
<p>B4029 Poster 16</p>	<p>Research on AIS Signal and Interference Signal Generated by AWG Simultaneously Mingju Gong, Sheng Wang, Qilin Wang, Chen Dong, Haojie Zhou and Yi Zhao Tianjin University of Technology, China</p> <p><i>Abstract</i>—Signal needs to co-exist with interference signal simultaneously when measuring the Anti-intermodulation interference capability of AIS receiver. Usually, AIS signal and interference signal are produced by an AWG (arbitrary waveform generator) and several signal sources. To reduce the cost of the instrument, as well as overcoming third-order interactive modulation distortion between the signal sources, this paper proposes a scheme that one AWG generates AIS signal and interference signal concurrently, and the theoretical simulation of the scheme shows the scheme is reasonable and feasible.</p>
<p>B4031 Poster 17</p>	<p>Energy Consumption Analysis of K Rank Fusion Detection under Noise Uncertainty Qian Ji-wu, Chen Yue-bin and Chen Chu-tian Yunnan Minzu University, China</p> <p><i>Abstract</i>—In cognitive unlimited power, single-user spectrum sensing due to environmental impact and hardware factors has been difficult to meet its quasi-conformity. To solve this problem, multi-user spectrum sensing technology has been proposed. However, most of the current literature only focuses on improving the detection performance of the system, and ignores the system energy consumed by processing data in the process of cooperative sensing. Therefore, this paper analyzes the energy consumption in spectrum sensing. In the case of combining noise uncertainty, the system energy is studied based on the K rank fusion rule in the hard fusion criterion. Through experimental simulation, the energy consumed by the system is reduced as the noise uncertainty is reduced.</p>
<p>B4037 Poster 18</p>	<p>Based on Improved Bio-inspired Model for Path Planning by Multi-AUV Lian Wu, Yiping Li and Jian Liu Northeastern University, China</p> <p><i>Abstract</i>—Aiming at path planning and collision avoidance of multiple autonomous underwater vehicle (AUV) system under complex environment, an improved neural network algorithm based on biological inspired model is proposed. Firstly, establishing an improved bio-inspired neural network model, the two-dimensional working area is rasterized, and each grid and neuron are one-to-one correspondence,</p>

	<p>stipulating that the interest area and the obstacle area of the grid correspond to the excitatory and inhibition of neurons respectively, affecting the neurons activity in the whole working area by the transversal function of the adjacent neurons each other. Secondly, AUV plans a safe and collision-free path by comparing the size of the activity of neighbor neurons. Then, Aiming at the problem that AUV moves clinging to the edge of obstacles, adding lateral inhibitory effects of the obstacles on the neural network and greatly improving the safety and rationality of the path planning. Finally, changing the property of grid positions of each AUV in real time to realize collision avoidance between multi-AUV. Simulation experiments prove that the improved algorithm is valid about the path planning in this thesis and the large allowance collision avoidance problem in a complex environment with single-AUV and multi-AUV.</p>
<p>B4001 Poster 19</p>	<p>Research on Fault Detection and Protection Strategy of HVDC Circuit Breaker Based on New Criterion Li Wei, Wu Xueguang, Chang Bin and Liu Dong North China Electrical Power University, China</p> <p><i>Abstract</i>—Increasing the breaking speed of the HVDC circuit breaker in the DC grid can provide an additional necessary time for other control strategies of the VSC-HVDC system during fault conditions. This paper presents a new fault local detection and power line protection control strategy for HVDC breakers based on Zhangbei four-terminal flexible HVDC transmission project. This method determines if the line has faults by monitoring the rate of change of voltage (ROCOV) at both ends of the DC line. And this method can realize fault local judgment and improve the speed of protection operation. In addition, the method of distinguishing the faults of adjacent lines, busbars and local lines is specifically proposed, and the accuracy of the proposed method and the selectivity, reliability and speed of protection actions are verified by PSCAD under different working conditions. For a flexible HVDC system which needs to quickly clear the fault, this method provides a new research idea for rapid self-breaking control strategy of DC circuit breaker.</p>
<p>B3008 Poster 20</p>	<p>Design of Sparse Cosine-Modulated Filter Banks Using BP Neural Network Wei Xu, Yi Li, Jinghong Miao and Jiaxiang Zhao Tianjin Polytechnic University, China</p> <p><i>Abstract</i>—This paper presents a design paradigm for sparse nearly perfect reconstruction cosine-modulated filter banks using BP neural network. Sparse FIR filter banks have lower implementation complexity than full filter banks with keeping a good performance level. First, a</p>

	<p>series of frequency response data satisfying perfect reconstruction condition are being selected. Second, the desired sparse linear phase FIR prototype filter is derived through the orthogonal matching pursuit performed under the weighted l_2 norm, and the training function and hidden layer nodes in BP neural network. The simulation results fully testified the proposed scheme for the design sparse NPR cosine-modulated filter banks is reviewed.</p>
<p>B4034 Poster 21</p>	<p>Research on Thermocline Tracking Based on Multiple Autonomous Underwater Vehicles Zhen Li and Yiping Li Northeastern University, China</p> <p><i>Abstract</i>—Thermocline is of great significance to marine scientific research. Multi-autonomous underwater vehicles (AUV) have great advantages over single autonomous underwater vehicle in ocean observation. This paper describes a control method for multi-agent formation. Based on this method, a strategy of multi-AUV formation for thermocline tracking is proposed. This paper firstly analyzes the stability of the formation control method based on the virtual body and artificial potential method (VBAP), and verifies the feasibility of this control method on the target-tracking problem by tracking a curved surface in space. Where after, in this paper, a thermocline tracking strategy based on vertical temperature gradient is proposed. Then the simulation experiment is designed based on the above control method and temperature data. The experimental results express that the multi-AUV formation can always keep working between the upper and lower boundary of thermocline, and tracks the thermocline effectively.</p>



Dinner	
18:45-20:00	Restaurant

Conference Venue

Academic Center, Tianjin Polytechnic University

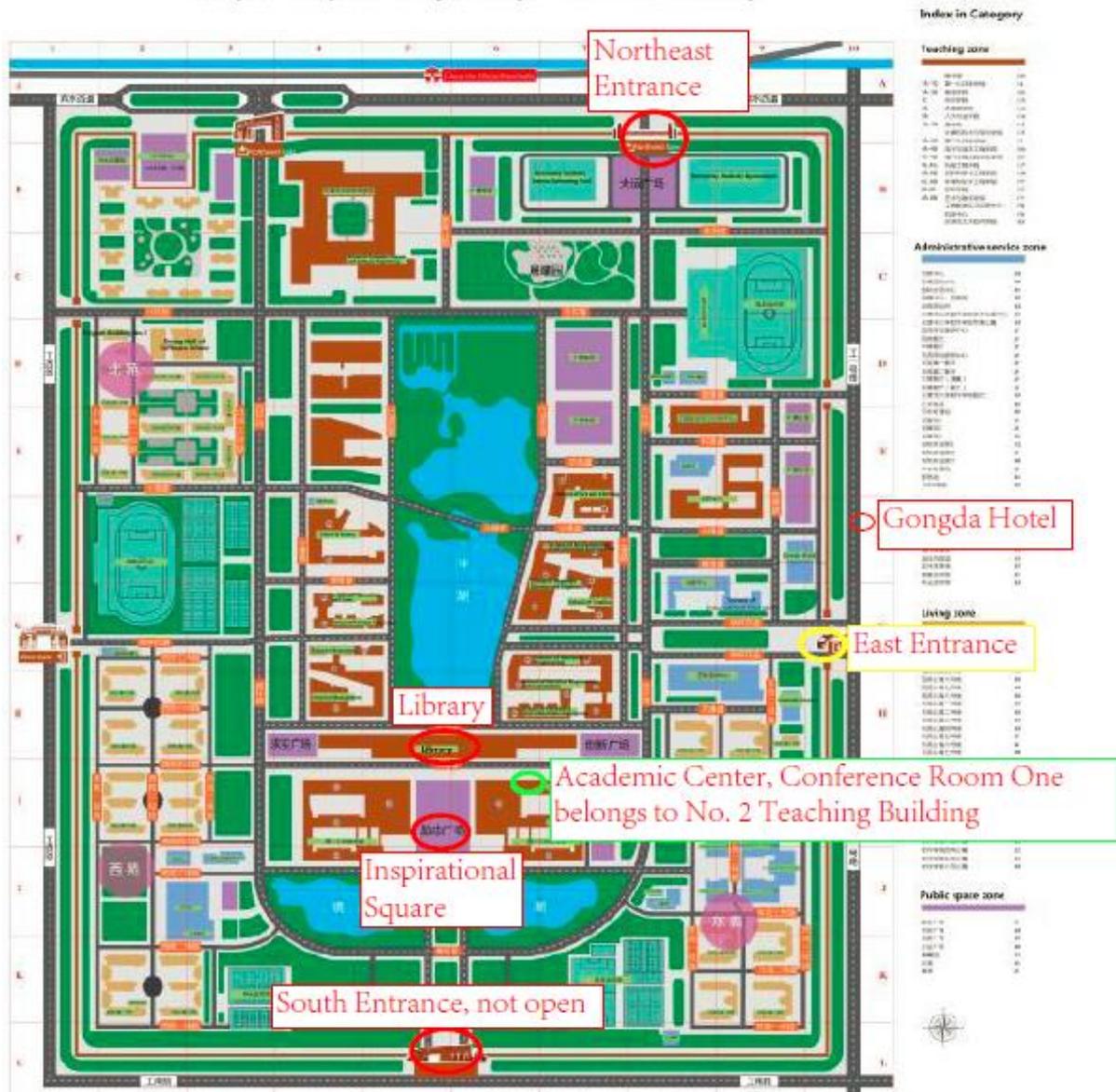
Addr.: First Floor, No. 2 Teaching Building, Academic Center, No. 399 Bin Shui Xi Road, Xi Qing District, Tianjin 300387, P.R. of China（第二公共教学楼学术中心第一会议室）



Tianjin Polytechnic University (TJPU) is a state-run full-time institution of higher education, which is jointly established by Ministry of Education and Tianjin Municipal Government. In 2003, TJPU received outstanding marks in the “Undergraduate Program Evaluation” sponsored by Ministry of Education. The 460-acre new campus has been completed in the scenery spot of Xiqing District since 2006. Currently, there are 1,600 full-time teachers and more than 800 administrative staffs in TJPU, of whom more than 800 are professors and associate professors. TJPU has also specially engaged over 20 academicians from the Chinese Academy of Sciences, the Chinese Academy of Engineering and renowned foreign scholars as visiting scholars and part-time professors.

Map

Campus Map of Tianjin Polytechnic University



Academic Visit & Tour

September 21, 2018 (Friday) 9:00-18:00

- (Tips: 1. Please arrive at the Tianjin Polytechnic University, Tianjin, China before 8:50 a.m.
2. The following places are for references, and the final schedule should be adjusted to the actual notice.
3. The quotation includes lunch. Other payment items are on own expense)

Time	Specific Arrangement
9:00-12:00	1. Tianjin Polytechnic University Scientific Research Center (天津工业大学科研中心) 2. Tiandy Technologies CO.,LTD (天津天地伟业有限公司)
12:00-13:30	3. Lunch (午餐)
13:30-17:30	4. Tianjin Five Old Street (天津五大道风情区) 5. Haihe River (海河游船)

Tianjin Polytechnic University Scientific Research Center's research programs include Functional fibers and technical textiles, Manufacturing of electromechanical facilities, Spinning oiling agent and auxiliaries development and application study, Textile reinforced composites and Membrane technology.

Tiandy Technologies CO., LTD is one of leading security manufactures in the world focusing on IP video surveillance, and the pioneer who applied starlight technology into industrial level network cameras to provide the customers 24hr brilliant color image, and TIANDY ranks No.11 in the security and No.5 in video surveillance in the A&S "Security 50 Ranking and Reports 2017".



Tianjin Five Old Street, Five Old Street refers to a rectangular area, which includes five roads. They are Chengdu Road, Chongqing Road, Dali Road, Munan Road, and Machang Road. They are totally seventeen kilometers long, covering the area of 1.28 square kilometers, including twenty-three roads. Why do people call it "five grand roads". The reason is that people just obey the day provided by official. When we mention the western-style buildings, there are many in Shanghai, Qinghai, and Xiamen, but comparatively speaking, Tianjin has the best preserved ones and those of most famous ones. And the most important reason is the residents here were, unusual. During the 20th to 30th of the last century, there were 2 presidents of Republic of China, Xu Shichang and Cao Kun, 7 premiers and many officials, as well as so many famous educationists, experts and generals lived here.



Haihe River is the largest river system in North China and one of the seven major rivers in China. From the Tianjin golden steel bridge to Dagu mouth into Bohai Bay, commonly known as Tianjin's "Mother River". The beautiful scenery on both sides of the Haihe River makes it necessary for Tianjin people and tourists to enjoy the charm of Tianjin by boat. Tianjin Haihe cruise ship is a unique tourism project in Tianjin, which takes Haihe River as the main body, enjoys and sees the beautiful scenery and architectural history and culture on both sides of Haihe River by boat.



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