

2018 CBEES-BBS HANOI, VIETNAM CONFERENCE ABSTRACT

February 26-28, 2018

Vietnam Academy of Science and Technology, Hanoi,
Vietnam



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Table of Contents

2018 CBEES-BBS Hanoi, Vietnam Conference Introduction	5
Presentation Instruction	6
Keynote Speaker Introduction	7
Brief Schedule for Conference	18
Detailed Schedule for Conference	19
Session 1: Image Processing and Application	
C0002: A Robust Liver Segmentation in CT-images Using 3D Level-Set Developed with the Edge and the Region Information <i>Thanh Sach Le and Duy Linh Tran</i>	21
C0023: An Experimental Study of Degree Distribution in Graph Sampling Algorithms <i>Suhyun Kim</i>	22
H0007: OD Localization using Rotational 2D Vessel Projection with Decision Tree Classification <i>Bodeetorn Sutcharit, Pakinee Aimmanee and Pongsate Tangseng</i>	23
H0009: Distance-to-Target Based Radiometric Calibration on Unmanned Aircraft Systems Images for Fields with Multiple Ground Control Points <i>Chao Sima, Yeyin Shi and J. Alex Thomasson</i>	24
H0012: Leukemia Blood Cell Image Classification using Convolutional Neural Network <i>T. T. P. Thanh, Caleb Vununu, Sukhrob Atoev, Suk-Hwan Lee and Ki-Ryong Kwon</i>	25
H0004: Fast Hemorrhage Detection in Brain CT Scan Slices using Projection Profile based Decision Tree <i>Sinachettra Thay, Pakinee Aimmanee, Bunyarit Uyyanavara and Pataravit Ruksku</i>	26
H4001: Solar Cell Micro-Crack Detection Using Localised Texture Analysis <i>Teow Wee Teo and Mohd Zaid Abdullah</i>	27
H0013: Novel Row Enumeration Approach of Graph-based Frequent Itemsets Mining <i>Mohd Arsyad Mohd Yakob, Shuzlina Abdul-Rahman and Sofianita Mutalib</i>	28
Session 2: Data Theory and Information Technology	
C3004: Large Sparse Complex Model and Advance Visualization of Magnetic Nanoparticle for Drug Delivery, Drug Release and Effects of Abnormal Cell Treatment on HPC Platform <i>Norma Binti Alias</i>	29
C0017: Outlier Detection of Categorical Data Using Median of Attribute Value Frequency <i>Kang-Mo Jung</i>	30
C3001: An Overview of Techniques for Confirming Big Data Property Rights <i>Susu Cheng and Haijun Zhao</i>	31

H0002: Mobility Patterns Based Clustering: A Novel Approach <i>Loc Hoang Tran and Linh Hoang Tran</i>	32
C0016: Simulation Wireless Sensor Networks in Castalia <i>Anh Khoa Ngo and Trong Thua Huynh</i>	33
C0020: An Application for Monitoring and Analysis HTTP Communications <i>Manh Cong Tran, Minh Hieu Nguyen and Thi Quang Nguyen</i>	34
C0022: Spoken Term Detection of Zero-Resource Language using Machine Learning <i>Akinori Ito and Masatoshi Koizumi</i>	35
C0004: Breadth First Search Algorithm combined with Knowledge Inference in Robotic Coverage Path Planning <i>Hai Pham, Thuan Do Phan and Philip T Moore</i>	36
C0007: Towards A Biographic Knowledge-based Story Ontology System <i>Jian-Hua Yeh</i>	37
Session 3: Bioinformatics Engineering	
H0005: Differential Profile Identification of Time-Course Gene Data with Fourier Transformation <i>Jaehee Kim and Haseong Kim</i>	39
H0010: Microbial Bioproduction with in Silico Artificial Metabolic Pathway Design and Enzyme Engineering <i>Tomokazu Shirai and Akihiko Kondo</i>	40
H0011: Weighted Frequent Itemset of SNPs in Genome Wide Studies <i>Sofianita Mutalib, Azlinah Mohamed, Shuzlina Abdul-Rahman and Norlaila Mustafa</i>	41
H0015: Evaluation of Database Annotation to Determine Human Mitochondrial Proteins <i>Katsuhiko Murakami and Masaharu Sugita</i>	42
C0021: Human Emotion Classification from Brain EEG Signal Using Multimodal Approach of Classifier <i>Nisha Kimmatkar and Vijaya Babu</i>	43
H0003: A Review of Contextual Information for Context-Based Approach in Sentiment Analysis <i>Nor Nadiah Yusof, Azlinah Mohamed and Shuzlina Abdul Rahman</i>	44
H0008: Improving Simplification of Support Vector Machine for Classification <i>Pham Quoc Thang, Hoang Thi Lam and Nguyen Thanh Thuy</i>	45
C0018: IoT-based Mobile Command Interface for Wildlife Emergency Response <i>Trung-Thanh Ngo and Dong-Seong Kim</i>	46
Poster Session	
C0009: High-performance Ultraviolet Photodetectors Based on ZnO Nanostructures <i>Suttinart Noothongkaew, O. Thumthan and Ki-Seok An</i>	47
C0019: Application of Artificial Neural Network for Prescribing Nonlinear Behavior of Power Systems <i>Chang-Ho Hyun, Dooil Choi, Jong-Eon Lee, Youn Seop Lee and Seung-Mook Baek</i>	48

H0006: Pose VariantFace Recognition Based on Linear Mapping <i>Wang Dianhua, Deng Shuwen and Liao Haibin</i>	49
C0015: Malware Analysis on Android using Supervised Machine Learning Techniques <i>Md. Shohel Rana and Andrew H. Sung</i>	50
C3005: Prediction of the Fourth Industrial Revolution Based on Time Series <i>Zhao Gang, Zhang Guangli, Liu Ming, Yu Shuqin Liu Yali and Yang Xiongfei</i>	51
Conference Venue	52
One Visit and Day Tour	53
Note	55
Feedback Information	57

2018 CBEES-BBS Hanoi, Vietnam Conference Introduction

Welcome to 2018 Hanoi, Vietnam conference which is sponsored by Hong Kong Chemical, Biological & Environmental Engineering Society (CBEES) and Biology and Bioinformatics (BBS), and co-sponsored by Institute of Biotechnology (IBT), Vietnam Academy of Science and Technology. The objective of Hanoi, Vietnam conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Bioinformatics and Computing Technologies and Intelligent Information Technology.

2018 International Conference on Bioinformatics and Computing Technologies (ICBCT 2018)

Papers will be published in one of the following journals:



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



International Journal of Machine Learning and Computing (IJMLC, ISSN: 2010-3700). Indexed by Scopus, EI (INSPEC, IET), Google Scholar, Crossref, ProQuest, Electronic Journals Library, and DOAJ.

Conference website and email: <http://www.icbct.org/>; icbct-info@cbees.net

2018 International Conference on Intelligent Information Technology (ICIIT 2018)

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



International Conference Proceedings Series by ACM (ISBN: 978-1-4503-6378-5), which will be archived in the ACM Digital Library, and indexed by Ei Compendex and submitted to be reviewed by Scopus and Thomson Reuters Conference Proceedings Citation Index (ISI Web of Science).



Journal of Advances in Information Technology (JAIT, ISSN:1798-2340), which will be indexed by EI INSPEC; EBSCO; ULRICH's Periodicals Directory; WorldCat; CrossRef; Genamics JournalSeek; Google Scholar; etc.

Conference website and email: <http://www.iciit.org/>; iciit@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 **35** Minutes of Presentation and **5** Minutes of Question and Answer

Plenary Speech: about **35** 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 February 26 and 27, 2018.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introduction

Keynote Speaker I



Prof. Taesung Park

Seoul National University, South Korea

Prof. Taesung Park received his B.S. and M.S. degrees in Statistics from Seoul National University (SNU), Korea in 1984 and 1986, respectively and received his Ph.D. degree in Biostatistics from the University of Michigan in 1990. From Aug. 1991 to Aug. 1992, he worked as a visiting scientist at the NIH, USA. From Sep. 2002 to Aug. 2003, he was a visiting professor at the University of Pittsburgh. From Sep. 2009 to Aug. 2010, he was a visiting professor in Department of Biostatistics at the University of Washington. From Sep. 1999 to Sep. 2001, he worked as an associate professor in Department of Statistics at SNU. Since Oct. 2001 he worked as a professor and currently the Director of the Bioinformatics and Biostatistics Lab. at SNU. He served as the chair of the bioinformatics Program from Apr. 2005 to Mar. 2008, and the chair of Department of Statistics of SNU from Sep. 2007 and Aug. 2009. He has served editorial board members and associate editors for the international journals including Genetic Epidemiology, Computational Statistics and Data Analysis, Biometrical Journal, and International journal of Data Mining and Bioinformatics. His research areas include microarray data analysis, GWAS, gene-gene interaction analysis, and statistical genetics.

Topic: “*Hierarchical Structural Component Analysis of Gene-Gene Interactions*”

Abstract—While many statistical approaches have been proposed to detect gene-gene interactions (GGI), most of these focus primarily on SNP-to-SNP interactions. While there are many advantages of gene-based GGI analyses, such as reducing the burden of multiple-testing correction, and increasing power by aggregating multiple causal signals across SNPs in specific genes, only a few methods are available. In this study, we proposed a new statistical approach for gene-based GGI analysis, “Hierarchical structural CoMponent analysis of Gene-Gene Interactions” (HisCoM-GGI). HisCoM-GGI is based on generalized structured component analysis (GSCA), and can consider hierarchical structural relationships between genes and SNPs. For a pair of genes, HisCoM-GGI first effectively summarizes all possible pairwise SNP-SNP interactions into a latent variable, from which it then performs GGI analysis. HisCoM-GGI can evaluate both gene-level and SNP-level interactions. Through

simulation studies, HisCoM-GGI demonstrated higher statistical power than existing gene-based GGI methods, in analyzing a GWAS of a Korean population for identifying GGI associated with body mass index.

Keynote Speaker II



Prof. Mohd Zaid Bin Abdullah
Universiti Sains Malaysia, Malaysia

M. Z. Abdullah graduated from Universiti Sains Malaysia (USM) with a B. App. Sc. degree in Electronic in 1986 before joining Hitachi Semiconductor as a test engineer. In 1989, he commenced an M.Sc. in Instrument Design and Application at University of Manchester Institute of Science and Technology, UK. He remained in Manchester conducting research in Electrical Impedance Tomography at the same university, and received his Ph.D. degree in 1993. He joined USM in the same year. His research interests include microwave tomography, digital imaging, and ultra-wide band sensing. He has published numerous research articles in international journals and conference proceedings. One of his papers was awarded The Senior Moulton medal for the best article published by the Institute of Chemical Engineering in 2002. Presently he is director of the Collaborative Microelectronic Design Excellence Centre (CEDEC), Universiti Sains Malaysia.

Topic: “*Machine Learning for Hairline Crack Detection in Cluttered Images*”

Abstract—The problem of machine learning for hairline crack detection is considered. As binarisation is one the important pre-processing steps of defect analysis, a new challenge emerges when distinguishing crack pixels from the foreground especially with low-contrast, non-uniform and cluttered images. This problem is encountered in numerous applications, ranging from inspection of biological materials to assessment of manufactured goods. If a simple global thresholding is used then the binarised image would be dominated with regions which are either too-dark or too-bright. This causes difficulty in feature extraction and subsequently high false alarm. Cluttering makes the problem much worst because intensities of foreground and background pixels are scattered at different positions, leading to heterogeneously textured image. This problem requires a powerful image processing technique which has been met following the development of a novel framework to accurately segment crack pixels in very heterogeneous background. The rationale behind this framework is that the gradient of an image is an important indicator of the probable crack edges. A 3-dimensional threshold surface is then constructed by interpolating the image gray levels at points of gradients. A refined anisotropic diffusion filter (ADF) with double thresholding has been developed for this purpose. Meanwhile the Radon transform (RT) has been utilised for feature extraction, and machine learning has been established via the state-of-the-art Twin Support Vector Machine (TSVM). Two real-world engineering problems have been used to

illustrate the practical applications of this new image processing approach. The first example is in manufacturing where the algorithm is used to automatically detect micro-crack defect in photoluminescence images of polycrystalline solar wafers. This innovation has resulted in a prototype which is now being commercialised by an industrial partner of this project. Meanwhile the second example deals with inspecting various types of hair-line cracks on eggshell in poultry farming. Algorithmic details together with instrumentation for image capturing will be discussed in the ensuing keynote lecture.

Keynote Speaker III



Prof. Francis Y. L. Chin

Hang Seng Management College and Emeritus Professor, University of Hong Kong, Hong Kong

Professor 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. He is now working as the Chair Professor and Head of Department of Computing at Hang Seng Management College and is in-charge of a Hong Kong RGC-funded project on Deep Learning.

Topic: *“Deep Learning and its Recent Developments”*

Abstract—There has been a resurgence of research into Artificial Intelligence and its applications, especially Machine Learning in the context of Big Data and Cloud Computing. Over the past few years, Google, Amazon, Baidu, Facebook and many major internet companies have invested significantly in Machine Learning technology, especially the so-called “Deep Learning” using very-large-scale multi-layer neural networks, in order to enhance their services and products, for example, speech/ image recognition, searching, data analytics, robotics, self-driving vehicles, Go-playing, etc. This talk explains how computers learn and the recent breakthroughs in Deep Learning which affect our lives in many aspects. We shall briefly mention the role of our newly established Deep Learning Research and Application Centre and potential research areas which might benefit from the new technology. The history of the development of machine translation will be reviewed, followed by the key

breakthroughs in using a single large neural network for statistical machine translation and our recent developments in translating business documents.

Plenary Speaker I



Prof. Sung-Nien Yu
National Chung Cheng University, Taiwan

Prof. Sung-Nien Yu received both his B.S. and M.S. degrees in Electrical Engineering from the National Taiwan University, Taipei, Taiwan, in 1987 and 1991, respectively. He received his Ph.D. degree in Biomedical Engineering from the Case Western Reserve University, Ohio, USA, in 1996. After graduation, he entered the Department of Physical Therapy at Chang Gung University, Tao-Yuan County, Taiwan and served as an assistant professor from 1996 to 1999. After that, he joined the Department of Electrical Engineering at National Chung Cheng University, Chia-Yi County, Taiwan in 1999 and is currently a professor of the department and the director of the Biomedical Signal Processing and System Design Laboratory. He is a member of the IEEE Engineering in Medicine and Biology Society and a permanent member of the Taiwanese Society of Biomedical Engineering. His research interests include biomedical signal processing, biomedical image processing, and the application of pattern recognition and machine learning technologies to biomedical problems.

Topic: “*Wavelet Decomposition and Higher Order Statistics for Electrocardiogram-Based Arrhythmia Recognition*”

Abstract—Arrhythmias are disorders of the rhythmic beating of the heart. Serious arrhythmias usually lead to heart diseases, stroke, or even sudden death. The electrocardiogram (ECG) is a low-cost, convenient, and non-invasive method to detect the electro-activity changes of the heart. Thus, ECG is usually used in the hospital as a routine and crucial means for the diagnosis of heart diseases by differentiating the pattern changes of different arrhythmias. In order to build an effective computer-aided-diagnosis (CAD) system for heart diseases, our laboratory has been exploring the use of wavelet decomposition and higher order statistics (HOS) to recognize different types of arrhythmias based on ECG. The discrete wavelet transform (DWT) decomposes a signal into subband components. Features extracted from these components can efficiently characterize the original signal in different frequency subbands. On the other hand, the HOS has been demonstrated to effectively suppress the influence of noises. Thus, the integration of the two techniques provides an opportunity not only to extract features that may otherwise been hidden in the original signal but also to reduce the influence of noises at the same time. In this talk, I will explain the method of integrating DWT and HOS for ECG-based arrhythmia recognition. The advantages of this approach, in terms of the recognition rates and noise-tolerance capability when compared with other methods, will be discussed. I will also describe our recent work

implementing this system on a smartphone for mobile health (mHealth) applications. Technologies will be addressed about how to transfer the algorithm onto a smartphone to achieve effective and real-time arrhythmia recognition.

Plenary Speaker II



Prof. Akinori Ito

Tohoku University, Japan

Akinori Ito was born in Yamagata, Japan on 1963. He received B.E., M.E., and Ph.D. degrees from Tohoku University, Sendai, Japan, on 1986, 1988 and 1991, respectively. Since 1991, he has worked with Research Center for Information Sciences and Education Center for Information Processing, Tohoku University. He was with the Faculty of Engineering, Yamagata University, from 1995 to 2002. From 1998 to 1999, he worked with the College of Engineering, Boston University, MA, USA, as a Visiting Scholar. He is now a Professor of the Graduate School of Engineering, Tohoku University. He is engaged in speech signal processing, human machine communication, music signal processing and speech-based language learning system. He is a member of the Acoustical Society of Japan, the Information Processing Society of Japan, IEICE, and the IEEE. He was a vice-president of the Acoustical Society of Japan from 2013 to 2014, a chair of IEEE Signal Processing Society Sendai Chapter from 2013 to 2016, and the editor-in-chief of the Acoustical Science and Technology from 2015 to 2016.

Topic: “*Human-Machine Meta-Communication*”

Abstract—“Meta-communication” is defined as “communication about communication”. Humans are not only making communication each other but also making meta-communication, which means that a human who wants to talk to others monitors whether the partner is ready to talk or not, how he/she is interested in the talk, how is the mental situation of the partner, etc. This kind of “meta-communication” is absolutely needed for artificial agents who talk with humans, but only limited approaches have been investigated for this purpose. In this talk, several attempts to establish the “meta-communication” between humans and machines will be introduced.

Plenary Speaker III



Prof. Le Thanh Hoa

Vietnam Academy of Science and Technology, Vietnam

Thanh Hoa Le is a Professor and a Principal Research Fellow at the Institute of Biotechnology (IBT) of Vietnam Academy of Science and Technology (VAST) in Hanoi, Vietnam. He obtained the veterinary doctor degree (DVM) in Microbiology and Infectious Diseases at the Hungarian University of Veterinary Sciences in Budapest in 1977; the MSc degree in Molecular Virology at the Melbourne University (Australia) in 1997, and the PhD degree in Tropical Health (Molecular Parasitology) at the University of Queensland and Queensland Institute of Medical Research (Australia) in 2001. He is currently the Chairman of the Panel for Life Sciences of the National Foundation of Science and Technology (NAFOSTED) (2017-2019). He completed a number of grants from the Wellcome Trust-UK, WHO-TDR, NAFOSTED-Vietnam, ICGEB-Italy in molecular genomics/ epidemiology/ phylogeny/ evolution of viruses and zoonotic parasites. He published over 70 international SCI/SCIE peer-reviewed papers; national papers, and scientific/text books. Major research areas and his scientific contributions are: molecular mitochondrial and ribosomal genomics and applied bioinformatics for zoonotic helminths/viruses and emerging pathogens/diseases; factors for immune response; vaccine technology and new generation vaccines, including DNA, vectoral and reverse genetics based-vaccines. He was invited to give numerous plenary, keynote and invited talks at various international conferences and lectures at foreign universities (Japan, Korea, Sri Lanka, India, Belgium etc...) as well as to review a number of scientific articles and books/book chapters. He was also organizer/chair for numerous international meetings/symposia and conferences.

Topic: *“Integrated Mitochondrial and Ribosomal Genomics: Exploring Database for Epidemiology, Diagnosis, Phylogeny and Evolution of Parasitic Zoonoses”*

Abstract—Cellular genomics including mitochondrial and nuclear ribosomal genomics, respectively, provide databases for molecular exploration in studies of epidemiology, diagnosis, phylogeny and evolution. Mitochondrial genome contains 12-13 protein-coding, 22 transfer RNA, 2 ribosomal RNA genes and non-coding regions rich in tandem repeats. Nuclear ribosomal transcription units (rTU) comprise of mainly 18S, ITS-1, 5.8S, ITS-2, 28S, and intergenic region (IGS), which are subjects for ribogenomics to get database for species-identification and evolutionary studies. Mito- and ribogenomics provide data for selection of genetic, mitochondrial DNA or ribosomal DNA markers, separately, or integrated markers explored from both sources for combination analysis in population genetics studies. Rich and valuable source of mito- and ribo-markers are also available for developing multiplex/genotyping PCR; mito-/ribo-LAMP and species diagnosis/identification within and

between numerous species from single or mixed samples. Many exploring tools/programs/software are available for data-mining for diverse use, particularly in phylogenetic and evolutionary studies. Increasing numbers of mitochondrial genomes and rTUs from living and pathogenic organisms are accumulated in GenBank and international databases including those from the parasitic zoonoses of neglected tropical diseases (NTD). To date, genomic data were obtained from at least 80 families of class Trematoda and Cestoda in phylum Platyhelminthes. In this talk, I would like to present integrated database of mito and ribogenomic sources and quote some representative examples of practical use for parasitic zoonoses and biomedical studies. Acknowledgments to the NAFOSTED Grant No 108.02-2017.09 (Vietnam).

Brief Schedule for Conference

Feb. 26, 2018 (Monday)	10:00~17:45 Arrival Registration (Lobby of Conference Room)
	14:00-14:05 Opening Remarks Assoc. Prof. Dong Van Quyen, Vietnam Academy of Science and Technology, Vietnam
	14:05-14:45 Keynote Speech I Prof. Taesung Park, Seoul National University, South Korea
	14:45-15:25 Keynote Speech II Prof. Mohd Zaid Bin Abdullah, Universiti Sains Malaysia, Malaysia
	15:25-15:45 Coffee Break & Group Photo
	15:45-17:45 Session 1 Topic: Image Processing and Application 8 presentations
Feb. 27, 2017 (Tuesday) Morning	09:00-09:05 Opening Remarks Assoc. Prof. Dong Van Quyen, Vietnam Academy of Science and Technology, Vietnam
	09:05-09:45 Keynote Speech III Prof. Francis Y. L. Chin, Hang Seng Management College and University of Hong Kong, Hong Kong
	09:45-10:25 Plenary Speech I Prof. Sung-Nien Yu, National Chung Cheng University, Taiwan
	10:25-10:50 Coffee Break & Group Photo
	10:50-11:30 Plenary Speech II Prof. Akinori Ito, Tohoku University, Japan
	11:30-12:10 Plenary Speech III Prof. Le Thanh Hoa, Vietnam Academy of Science and Technology, Vietnam
	12:10-13:30 Lunch (Cafeteria in VAST)
Feb. 27, 2017 (Tuesday) Afternoon	13:30-15:45 Session 2 Topic: Data Theory and Information Technology 9 presentations
	15:45-16:05 Coffee Break
	16:05-18:05 Session 3 Topic: Bioinformatics Engineering 8 presentations
	18:30~20:00 Dinner (Restaurant)
Feb. 28, 2017 (Wednesday)	09:30~17:30 One Day Visit and Tour

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

Detailed Schedule for Conference



February 26, 2018 (Monday)

Venue: Conference Room (8th Floor)



10:00~17:45	Arrival and Registration (Lobby of Conference Room)	
14:00-14:05		Opening Remarks Assoc. Prof. Dr. Dong Van Quyen Vietnam Academy of Science and Technology, Vietnam
14:05-14:45		Keynote Speech I Prof. Taesung Park Seoul National University, South Korea Topic: <i>"Hierarchical Structural Component Analysis of Gene-Gene Interactions"</i>
14:45-15:25		Keynote Speech II Prof. Mohd Zaid Bin Abdullah Universiti Sains Malaysia, Malaysia Topic: <i>"Machine Learning for Harline Crack Detection in Cluttered Images"</i>
15:25-15:45	Coffee Break & Group Photo	
15:45-17:45	Session 1 Topic: Image Processing and Application	

February 27, 2018 (Tuesday)

Venue: Conference Room (8th Floor)

09:00-09:05		Opening Remarks Assoc. Prof. Dr. Dong Van Quyen Vietnam Academy of Science and Technology, Vietnam
09:05-09:45		Keynote Speech III Prof. Francis Y. L. Chin Hang Seng Management College and University of Hong Kong, Hong Kong Topic: <i>"Deep Learning and its Recent Developments"</i>
09:45-10:25		Plenary Speech I Prof. Sung-Nien Yu National Chung Cheng University, Taiwan Topic: <i>"Wavelet Decomposition and Higher Order Statistics for Electrocardiogram-Based Arrhythmia Recognition"</i>
10:25-10:50	Coffee Break & Group Photo	

2018 CBEES-BBS HANOI, VIETNAM CONFERENCE

<p>10:50-11:30</p>		<p>Plenary Speech II Prof. Akinori Ito Tohoku University, Japan Topic: “<i>Human-Machine Meta-Communication</i>”</p>
<p>11:30-12:10</p>		<p>Plenary Speech III Prof. Le Thanh Hoa Vietnam Academy of Science and Technology, Vietnam Topic: “<i>Integrated Mitochondrial and Ribosomal Genomics: Exploring Database for Epidemiology, Diagnosis, Phylogeny and Evolution of Parasitic Zoonoses</i>”</p>
<p>12:10-13:30</p>	<p>Lunch (Cafeteria in VAST)</p>	
<p>13:30-15:45</p>	<p>Session 2 Topic: Data Theory and Information Technology</p>	
<p>15:45-16:05</p>	<p>Coffee Break</p>	
<p>16:05~18:05</p>	<p>Session 3 Topic: Bioinformatics Engineering</p>	
<p>18:30-20:00</p>	<p>Dinner (Restaurant)</p>	

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

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

(3) One Best Oral Presentation will be selected from each oral presentation session, and the Certificate for Presentation will be awarded at the end of each session on February 26 and 27, 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, February 26, 2018 (Monday)

Time: 15:45-17:45

Venue: Conference Room (8th Floor)

Session 1: Topic: “Image Processing and Application”

Session Chair: Prof. Sung-Nien Yu

C0002 Presentation 1 (15:45~16:00)

A Robust Liver Segmentation in CT-images Using 3D Level-Set Developed with the Edge and the Region Information

Thanh Sach Le and Duy Linh Tran

Ho Chi Minh City University of Technology, Vietnam

Abstract—CT-images have been used widely in hospitals around the world. The segmentation of liver from CT-images is important, because it can help medical doctors to have a clear view of the liver with rendering tools. The segmentation’s result is also useful for radiotherapy. However, liver segmentation is a challenging task because of the liver’s geometrical structure and position and because of the similarity between the liver and its nearby organs about the intensity of voxels. In this paper, we propose a method to segment the liver from CT-images by modeling the segmentation with a proposed level-set method on 3D-space. In combination with the proposed 3D level-set methods, we propose to combine the edge information with the region information into the level-set’s energy function. The experimental results are compared with manual segmentation performed by clinical experts and with recently developed methods for liver segmentation. Our proposed method can perform the segmentation more accurate in comparison with the others. It also can produce a surface that is smoother than one resulted from the other methods in the comparison.

Afternoon, February 26, 2018 (Monday)

Time: 15:45-17:45

Venue: Conference Room (8th Floor)

Session 1: Topic: “Image Processing and Application”

Session Chair: Prof. Sung-Nien Yu

C0023 Presentation 2 (16:00~16:15)

An Experimental Study of Degree Distribution in Graph Sampling Algorithms

Suhyun Kim

KIST, South Korea

Abstract—Graph analytics is often used to analyze various types of networks. Since real-world graphs are gigantic, analyzing them untouched incurs tremendous overhead. Graph sampling is used to extract a representative subgraph that can be manipulated with more ease. Many sampling algorithms have been proposed, and recently a List Sampling framework was demonstrated to have some desirable characteristics. Still, a low complexity sampling algorithm that can produce a subgraph accurately mirroring the original graph is highly demanded. In this presentation, the author proposes another variation of List Sampling and compares it with previous approaches. Real-world data sets are used to measure the distribution of original degree and sampled degree. It is also compared with Metropolis-Hasting random walk, and in-depth analysis of where the difference in the sampling result arises is given.

Afternoon, February 26, 2018 (Monday)

Time: 15:45-17:45

Venue: Conference Room (8th Floor)

Session 1: Topic: “Image Processing and Application”

Session Chair: Prof. Sung-Nien Yu

H0007 Presentation 3 (16:15~16:30)

OD Localization using Rotational 2D Vessel Projection with Decision Tree Classification

Bodeetorn Sutcharit, Pakinee Aimmanee and Pongsate Tangseng

Sirindhorn International Institute of Technology, Thailand

Abstract—Automatic Optic Disc (OD) localization is an important problem in ophthalmic image processing. Knowing its location helps doctors with the early detection of preventable eye diseases. Inspired by a fast and accurate OD localization algorithm utilizing the vessel projection technique that is usually inefficient when the OD in the image is unusually pale, we employed the decision tree with 5 features to improve the accuracy of the existing algorithm. Also to overcome the problem of poor accuracy when the image is tilted, we repeatedly run this improved algorithm on a series of images tilted at different degree from the original image to obtain the voted location of the OD.

The proposed method has been tested on different starting angles between 0 to 180 degrees from Structured Analysis of the Retina (STARE) and retinopathy of prematurity (ROP) datasets. We achieve an average accuracy of up to 86% with an average computation time per image of only 13 seconds per image. Our approach outperforms two other based approaches, Mahfouz and Rotational 2D Vessel Projection (RVP), by up to 34% and 12%, respectively.

Afternoon, February 26, 2018 (Monday)

Time: 15:45-17:45

Venue: Conference Room (8th Floor)

Session 1: Topic: “Image Processing and Application”

Session Chair: Prof. Sung-Nien Yu

H0009 Presentation 4 (16:30~16:45)

Distance-to-Target Based Radiometric Calibration on Unmanned Aircraft Systems Images for Fields with Multiple Ground Control Points

Chao Sima, Yeyin Shi and J. Alex Thomasson

Texas A&M Engineering Experiment Station, USA

Abstract—With the world population projected to reach 9 billion by 2050, there is an increasing need to accelerate the agriculture productivity. One way of improving the crops is through high-throughput phenotyping and data-driving precise agricultural decisions. Core of the issue is to provide farmers with high quality data with proper calibration. In this study, we strategically installed multiple semi-permanent ground control points (GCP) of painted concrete blocks with pre-measured reflectance, and used Unmanned Aircraft Systems to obtain high-resolution images over the farm fields. The images generated by the fixed-wing PrecisionHawk Lancaster were mosaicked and all GCPs and reflectance targets were automatically identified through an image-processing procedure on the mosaicked image, a procedure that focused on efficiency and automation for maximum potential in farming industry. A digital number to reflectance calibration curve is then derived. We took advantage of the multiple GCPs and radiometric calibrated the whole field by weighting on the distances from the pixels to the GCPs. Measured in root mean square (RMS) errors, a better accuracy was achieved by using this Distance-to-Target based radiometric calibration than the approach where this distance information was not considered, providing improved calibrated data that potentially lead to more informed agricultural decisions.

Afternoon, February 26, 2018 (Monday)

Time: 15:45-17:45

Venue: Conference Room (8th Floor)

Session 1: Topic: “Image Processing and Application”

Session Chair: Prof. Sung-Nien Yu

H0012 Presentation 5 (16:45~17:00)

Leukemia Blood Cell Image Classification using Convolutional Neural Network

T. T. P. Thanh, Caleb Vununu, Sukhrob Atoev, Suk-Hwan Lee, and Ki-Ryong Kwon

Pukyong National University, Korea

Abstract—Acute myeloid leukemia is a type of malignant blood cell cancer that can affect both children and adults. There are 60,140 people were expected to be diagnosed with Leukemia in 2016, according to the Leukemia and Lymphoma Society. In order to get the most effective treatment, the patient needs early diagnosis. Therefore we need to have a support system of early diagnosis to guide treatment for patients with acute leukemia as soon as possible. In this paper, the authors propose a Convolutional Neural Network (CNN) based method to distinguish normal and abnormal blood cell images. The proposed method achieves an accuracy up to 96.6% with the dataset including 1188 blood cell images.

Afternoon, February 26, 2018 (Monday)

Time: 15:45-17:45

Venue: Conference Room (8th Floor)

Session 1: Topic: “Image Processing and Application”

Session Chair: Prof. Sung-Nien Yu

H0004 Presentation 6 (17:00~17:15)

Fast Hemorrhage Detection in Brain CT Scan Slices using Projection Profile based Decision Tree

Sinachettra Thay, Pakinee Aimmanee, Bunyarit Uyyanavara and Pataravit Ruksku

Thammasat University, Thailand

Abstract—Detection of a hemorrhage in CT scan slices is one of the crucial steps for a neurosurgeon to diagnose any abnormality and severity in the brain of a patient. It is usually time consuming as there are as many as 256 produced slices from a CT scan machine for each patient. In this paper, we introduce an automatic hemorrhage detection in brain CT slices using features-based approach. We employ decision tree based on 8 features to classify slices to two classes- with and without the sign of hemorrhage. The proposed method is tested on 1,451 CT scan slices and achieves a classification accuracy for up to 99% and it takes 0.12 second to detect slices.

Afternoon, February 26, 2018 (Monday)

Time: 15:45-17:45

Venue: Conference Room (8th Floor)

Session 1: Topic: “Image Processing and Application”

Session Chair: Prof. Sung-Nien Yu

H4001 Presentation 7 (17:15~17:30)

Solar Cell Micro-Crack Detection Using Localised Texture Analysis

Teow Wee Teo and **Mohd Zaid Abdullah**

Universiti Sains Malaysia, Malaysia

Abstract—A novel method to classify micro-cracks in photoluminescence (PL) images of polycrystalline solar cells is proposed. Micro-cracks in PL images are difficult distinguish as they're easily confused with noises that are present which may share the same size and shape features. Instead of relying on shape analysis to classify micro-cracks, the proposed method takes advantage of the patterns that are present at the end points of micro-cracks. Textural features are extracted via grey level co-occurrence matrix at the end points and then used as feature vectors in a SVM classifier. The proposed method is compared against existing shape analysis method and a preliminary experimental result has shown a significant improvement in sensitivity, specificity and accuracy.

Afternoon, February 26, 2018 (Monday)

Time: 15:45-17:45

Venue: Conference Room (8th Floor)

Session 1: Topic: “Image Processing and Application”

Session Chair: Prof. Sung-Nien Yu

H0013 Presentation 8 (17:30~17:45)

Novel Row Enumeration Approach of Graph-based Frequent Itemsets Mining

Mohd Arsyad Mohd Yakob, **Shuzlina Abdul-Rahman** and Sofianita Mutalib

Universiti Teknologi Mara, Malaysia

Abstract—A lot of algorithms performing Frequent Itemsets Mining (FIM), however, some of the glitches in the algorithms still require attention, particularly when the mining process involves a high dimensional dataset. The Directed Acyclic Graph in High Dimensional Dataset Mining (DAGHDDM) is a graph-based mining algorithm that represents itemsets in the complete graph before FIM takes place. Nevertheless, the construction of complete graph creates unnecessary edges and makes the search space large and affects the overall algorithm performance. This research aims to speed up the searching process by creating relevant edges in the graph to reduce the search space by rearranging the items using the common prefix rowset. We proposed a novel frequent itemsets mining using row enumeration approach on graph based structure called Frequent Row Graph Closed (FRG-Closed). Designing the FRG-Closed involves new data structure creation known as Frequent Row Graph (FR-Graph). We performed the experiments to compare the performance of FRG-Closed with DAGHDDM algorithm. The result of the experiments revealed the FRG-Closed capability to mine the frequent closed itemsets faster than its counterpart, DAGHDDM algorithm. Moreover, the FRG-Closed is also able to handle lower minimum support compared to the DAGHDDM for a larger transaction.

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, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

C3004 Presentation 1 (13:30~13:45)

Large Sparse Complex Model and Advance Visualization of Magnetic Nanoparticle for Drug Delivery, Drug Release and Effects of Abnormal Cell Treatment on HPC Platform

Norma Binti Alias

Universiti Teknologi Malaysia, Malaysia

Abstract—Mathematical modeling and simulation are the important tools to predict and visual the nanocarriers movement for delivering anti-cancer drugs to therapeutic sites. It is because the experiment and implementation involve a nano-scale level and very complex process of drug delivery systems along circulation in the blood flow. In additional, the location of the targeted and effected cell is extremely high sensitivity such as brain, breast, prostate and cervical cancers. The technology of magnetic nanoparticle for drug delivery avoids the movement disorders and highlights the size-controlled preparation of drug release at the effected cancer cell. Thus, a large sparse complex model and advance visualization of the nanopartical drug delivery and drug release are the alternative strategies to observe and monitor a long-term drug delivery, adsorption applicability and controlled the release of drugs under simulated digestion conditions of the nanocarriers. This paper focuses on two mathematical models, discretization based on finite element method (FEM), finite difference method (FDM), simulation of parallel algorithms, implementation of high performance computing (HPC) system and analyze using numerical results and parallel performance indicators (PPI). The HPC platform consists a distributed memory architecture integrated with a number of processors to support a large sparse data simulation. The significance of nanodrugs design, delivery patterns and effects of abnormal cell can be observed using the integration of the two mathematical models. The visualization of modeling, simulation effect of abnormal cell and the validation analysis are considered as the outcome of this research. Graph visualization and table form support the numerical results, PPI and discussions. This research provides the accurate prediction for preparing, characterizing and classifying the magnetic nanoparticle to the immunotherapy, nanotechnology and biomedical practitioners.

Afternoon, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

C0017 Presentation 2 (13:45~14:00)

Outlier Detection of Categorical Data Using Median of Attribute Value Frequency

Kang-Mo Jung

Kunsan National University, South Korea

Abstract—Outlier detection is a fundamental task of many big data applications, for example detecting insurance fraud, medical diagnosis or industrial damage. Most outlier detection methods work on numerical data, however there are few research works on outlier detection for categorical data. The attribute value frequency score for each record summarizes the frequentness of the categorical data. We propose a very fast outlier detection algorithm using the median, not mean of attribute value frequency score. It is well known that the median is more robust than the mean. Thus our approach is robust to other methods. Furthermore, we propose a fast algorithm for the attribute value frequency score of multiple records as well as single record. The performance of the proposed algorithm can be illustrated for UCI machine learning datasets. Our solution is experimentally shown to be significantly faster, and as effective in detecting outliers.

Afternoon, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

C3001 Presentation 3 (14:00~14:15)

An Overview of Techniques for Confirming Big Data Property Rights

Susu Cheng and Haijun Zhao

Guangdong University of Finance and Economics, China

Abstract—The major premise of big data circulation is to identify the ownership of data resource. This paper summed some feasible techniques and methods for confirming big data property which are data citation technology, data provenance technology, data reversible hiding technology, computer forensic technology and block chain technology. The ownership of information property which from different sizes, different formats and different storage condition on distributed heterogeneous platforms can be confirmed by comprehensive application of these techniques and methods based on the coupling interface between them in the practice of big data.

Afternoon, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

H0002 Presentation 4 (14:15~14:30)

Mobility Patterns Based Clustering: A Novel Approach

Loc Hoang Tran and Linh Hoang Tran

Thu Dau Mot University, Vietnam

Abstract—Clustering is the basic technique in data mining research field. However, there are just few mobility patterns based clustering techniques which are hierarchical clustering and k-means clustering. Moreover, these two techniques suffer from the so-called “curse of dimensionality”. Hence in this paper, the spectral clustering methods and the novel power symmetric normalized spectral clustering method are proposed and these three methods are used to solve the mobility pattern based clustering problem. First, the novel similarity among mobility patterns is defined in the trajectory dataset. From this novel similarity, a similarity graph can be constructed. Finally, the three proposed clustering methods are applied to this graph. Experimental results show that the clustering results of the power symmetric normalized clustering method are more well-balanced than the clustering results of the un-normalized and symmetric normalized spectral clustering methods. Moreover, the time complexity of the power symmetric normalized clustering method is also lower than the time complexity of the two spectral clustering methods.

Afternoon, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

C0016 Presentation 5 (14:30~14:45)

Simulation Wireless Sensor Networks in Castalia

Anh Khoa Ngo and Trong Thua Huynh

Posts & Telecommunications Institute of Technology, Vietnam

Abstract—Wide application usage of Wireless Sensor Network (WSN) triggers many developments in this area. Properly selecting network simulator plays an important role for developing WSN routing protocol and MAC protocol since its different performance focuses. This paper aims to provide an adequate guidance for simulation in Castalia which is suitable for low power sensor nodes deployed in large-scale wireless sensor networks. Moreover, LEACH is a well-known routing protocol, which is used for demonstration along the basic guidance. Lastly, manipulating data extracted from Castalia Result is documented for wide understanding what Castalia aid in WSN research.

Afternoon, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

C0020 Presentation 6 (14:45~15:00)

An Application for Monitoring and Analysis HTTP Communications

Manh Cong Tran, Minh Hieu Nguyen and Thi Quang Nguyen

Le Quy Don Technical University, Vietnam

Abstract—The World Wide Web is the most prevalence information system on the Internet. That makes HTTP protocol becomes attractive target for cybercrimes take it as communication environment to transmit malicious contents or forbidden information such as user private information. This raises the demand for monitoring and analysis HTTP traffic in network. In this paper, monitoring features are extracted from HTTP basic properties, based on these an application for monitoring and analysis HTTP communications is proposed. The system will help network and system administrators to early detect threads in HTTP environment by clustering and identifying HTTP traffic. From there, necessary and suitable decides will be acted.

Afternoon, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

C0022 Presentation 7 (15:00~15:15)

Spoken Term Detection of Zero-Resource Language using Machine Learning

Akinori Ito and Masatoshi Koizumi

Tohoku University, Japan

Abstract—In this paper, we propose a spoken term detection method for detection of terms in zero-resource languages. The proposed method uses the classifier (the speech comparator) trained by a machine learning method combined with the dynamic time warping method. The advantage of the proposed method is that the classifier can be trained using a large language resource that is different from the target language. We exploited the random forest as a classifier, and carried out an experiment of the spoken term detection from Kaqchikel speech. As a result, the proposed method showed better detection performance compared with the method based on the Euclidean distance.

Afternoon, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

C0004 Presentation 8 (15:15~15:30)

Breadth First Search Algorithm Combined with Knowledge Inference in Robotic Coverage Path Planning

Hai Pham, Thuan Do Phan and Philip T Moore

Hanoi University of Science and Technology, Vietnam

Abstract—Robotics is a rapidly evolving and developing research field encompassing domains ranging from industrial robots to empathetic robots acting as human companions. In the future, robots will be highly dependent on the ability to understand, interpret, and generate a representation of the environment in which they are operating, ideally in both a human and machine-readable formalism. An important function in this process lies in path planning with obstacle avoidance in dynamic environments (including cleaning and monitoring in robotics) to identify the optimal coverage paths. The study presented in this paper introduces a new approach which combines knowledge reasoning techniques with breadth first search to find the optimal path for a cleaning robot in a dynamic environment. This approach is used to apply knowledge inference with conventional coverage path planning algorithms to enable autonomous robot control with obstacle avoidance and optimal coverage path planning. The experimental results show that using the proposed approach a robot avoids fixed and mobile obstacles, optimal path planning reducing both computational cost and time. When compared to other current approaches, the proposed approach with high coverage rate and low repetition rate in coverage performs better than the conventional Robot algorithms.

Afternoon, February 27, 2018 (Tuesday)

Time: 13:30-15:45

Venue: Conference Room (8th Floor)

Session 2: Topic: “Data Theory and Information Technology”

Session Chair: Assoc. Prof. Norma Binti Alias

C0007 Presentation 9 (15:30~15:45)

Towards A Biographic Knowledge-based Story Ontology System

Jian-Hua Yeh

Aletheia University, Taiwan

Abstract—In this article, we illustrate some of the semantic web-related technologies and design a set of ontology knowledge structures based on biographical history, using the OWL markup language, which we call BKOnto. This is an official framework for processing biographical history-related messages on the semantic web, including biographical events, time and space relationships, related personal messages, and more. We elaborate on this ontology knowledge architecture and explain how to use BKOnto as a basis for more domain-specific knowledge representation. In BKOnto, we use the OWL language to define the main components of the cognitive structure of the historical body of biography, namely the Storyline of the biography and the historical event of the biography. The so-called biographical story line, which is used to organize the history of multiple biographical superstructure, can be used to describe the biography of a particular person. The so-called biographical historical events, based on the historical data can be based on the description of the content and related space-time factor description of the basic unit. BKOnto's design was based on the StoryLine and Event infrastructure, and then we developed the ontology knowledge building system based on this ontology awareness architecture. Therefore, we also developed a set of ontology knowledge building system based on BKOnto, which is called StoryTeller. The StoryTeller system can be used to construct relevant knowledge of human things in the history of the biography and form a complete biographical story. StoryTeller system, mainly based on the story line organized by the timeline, which contains a number of types and events related to multiple human things as the basic unit to build the story line. The event unit not only describes the description of related human affairs, but also contains the description of time factor and space factor, which is used to construct the space-time information of the unit in the story line. As a result, in a story line with multiple event units, you will be able to present a wealth of information about people and things with their associated spatiotemporal features. In addition, based on the idea of supporting the digital collection system, we also linked up individual event units with the digital collection system of their information sources so that more diverse digital collections could be presented in the future. The empirical study also uses the Mackay Digital Archives Project

(<http://dml.csie.au.edu.tw/>) as a source of information to demonstrate the ontology knowledge building process of Mackay's biographical stories, as well as related Digital collection of information.



Session 3

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

Afternoon, February 27, 2018 (Tuesday)

Time: 16:05-18:05

Venue: Conference Room (8th Floor)

Session 3: Topic: “Bioinformatics Engineering”

Session Chair: Prof. Haijun Zhao

H0005 Presentation 1 (16:05~16:20)

Differential Profile Identification of Time-Course Gene Data with Fourier Transformation

Jaehee Kim and Haseong Kim

Duksung Women’s University, Korea

Abstract—Time course gene expression experiments are an increasingly popular method for exploring biological processes. Temporal gene expression profiles provide an important characterization of gene function, as biological systems are both developmental and dynamic. With such data it is possible to study gene expression changes over time and thereby to detect differential genes. Since time series expression is a temporal process, its unique features such as autocorrelation between successive points should be incorporated into the analysis.

This work aims to identify genes that show different gene expression profiles across time. A statistical procedure is proposed to discover gene groups with similar profiles using a nonparametric representation that accounts for the autocorrelation in the data as follows: (i) representation of gene profiles in the Fourier domain; (ii) automatic screening of genes based on the Fourier coefficients and taking into account autocorrelation in the data, while controlling the false discovery rate (FDR); (iii) model-based clustering of the remaining gene profiles. The proposed method is general and can be potentially used to identify genes which have the same patterns or biological processes, and help facing the present and forthcoming challenges of data analysis in functional genomics. Yeast cell-cycle microarray data is analyzed as a real application.

Afternoon, February 27, 2018 (Tuesday)

Time: 16:05-18:05

Venue: Conference Room (8th Floor)

Session 3: Topic: “Bioinformatics Engineering”

Session Chair: Prof. Haijun Zhao

H0010 Presentation 2 (16:20~16:35)

Microbial Bioproduction with in Silico Artificial Metabolic Pathway Design and Enzyme Engineering

Tomokazu Shirai and Akihiko Kondo

RIKEN, Japan

Abstract—Technologies of metabolic engineering or synthetic biology are essential for effective microbial bioproduction. It is especially important to develop an in silico tool for designing a metabolic pathway producing an unnatural and valuable chemical such as fossil materials of fuel or plastics. Here, BioProV, which is an in silico tool for designing novel metabolic pathways, is demonstrated as follows. We search for novel enzyme reaction patterns considered to be highly reactive with a target molecule by categorizing the existing enzyme reactions in a database into patterns based on their reaction characteristics. In addition, we choose the optimum metabolic reaction pathway from the novel reactions listed as candidates, using a computer simulation based on thermodynamic considerations. The in silico tool allowed us to predict easily novel enzyme reactions by computer calculations, and allowed us to search for metabolic reactions for producing engineering plastics and synthetic rubber monomers. Using the tool, we designed a novel metabolic pathway for isoprene biosynthesis and construct it with enzyme engineering.

Afternoon, February 27, 2018 (Tuesday)

Time: 16:05-18:05

Venue: Conference Room (8th Floor)

Session 3: Topic: “Bioinformatics Engineering”

Session Chair: Prof. Haijun Zhao

H0011 Presentation 3 (16:35~16:50)

Weighted Frequent Itemset of SNPs in Genome Wide Studies

Sofianita Mutalib, Azlinah Mohamed, Shuzlina Abdul-Rahman and Norlaila Mustafa

Universiti Teknologi Mara, Malaysia

Abstract—Genome wide association study (GWAS) is a study to investigate the correlations between genetic variants and traits. GWAS normally focus on the associations between single-nucleotide polymorphisms (SNPs) and traits like major human diseases. Generally, GWAS uses standard statistical tests on each SNP to capture main the genetic effects. However, the association is done between a single SNP and the trait. This study make use the whole sets of available SNPs in GWAS, data mining approach is applied to associate more than one SNPs to traits. In general, this will complement the GWAS to help understand complex diseases. This paper presents a proposed frequent itemset mining with weights to discover important sets of SNPs that are associated with diabetes. The purpose of using weights is to mine SNPs that might be less frequent but important in the study of diabetes. The approach consists of three stages: first, reduction of feature space and testing them through classifiers; second, the selection of informative SNPs through allelic testing; then, weight assignment for the selected SNPs; and third, itemset mining and gene analysis. The proposed approach has proven to be effective by helping to discover genes that have associated with the risk of diabetes. These patterns could be used as a set of significant information extracted by mining genetic variants in any particular SNP.

Afternoon, February 27, 2018 (Tuesday)

Time: 16:05-18:05

Venue: Conference Room (8th Floor)

Session 3: Topic: “Bioinformatics Engineering”

Session Chair: Prof. Haijun Zhao

H0015 Presentation 4 (16:50~17:05)

Evaluation of Database Annotation to Determine Human Mitochondrial Proteins

Katsuhiko Murakami and Masaharu Sugita

University of Tokyo, Japan

Abstract—Subcellular localization can be a helpful indication of the function of an unknown protein. Among the reported human mitochondrial proteins, hundreds of proteins have still not been functionally confirmed. To date, several databases for such proteins have been developed; however, their annotations overlap incompletely. A key issue in the completion of a reliable catalog of mitochondrial proteins is the integration of all this information, and the evaluation of the influence of different forms of evidence is also important. Here, we integrated various pieces of evidence (features) from both experimental and computational analyses. Linear and nonlinear prediction models were examined to predict human mitochondrial proteins. By employing a random forest model, an F-score of 0.929 was achieved by cross validation. The contributions of individual features toward the accurate prediction of localization were evaluated. We found only minor differences in importance among different features, with accurate prediction requiring the combination of many features; however, evidence from mass spectrometry experiments emerged as a prominent feature. Focusing on human mitochondrial proteins, we have constructed a high-accuracy prediction model that utilizes many weak features. Evaluation of the importance of individual features provides insights into what information is most valuable for the confirmation of protein localization.

Afternoon, February 27, 2018 (Tuesday)

Time: 16:05-18:05

Venue: Conference Room (8th Floor)

Session 3: Topic: “Bioinformatics Engineering”

Session Chair: Prof. Haijun Zhao

C0021 Presentation 5 (17:05~17:20)

Human Emotion Classification from Brain EEG Signal Using Multimodal Approach of Classifier

Nisha Kimmatkar and Vijaya Babu

KL University, India

Abstract—In this paper, we describe the formatting guidelines for ACM SIG Proceedings. To deeply understand the brain response under different emotional states can fundamentally advance the computational models for emotion recognition. Various psychophysiology studies have demonstrated the correlations between human emotions and EEG signals. With the quick development of wearable devices and dry electrode techniques it is now possible to implement EEG-based emotion recognition from laboratories to real-world applications. In this paper we have developed EEG-based emotion recognition models for three emotions: positive, neutral and negative. Extracted features are downloaded from seed database to test a classification method. Gamma band is selected as it relates to emotional states more closely than other frequency bands. The linear dynamical system (LDS) is used to smooth the features before classification. The classification accuracy of the proposed system using DE, ASM, DASM, RASM is 97.33, 89.33 and 98.37 for SVM (linear), SVM(rbf sigma value 6) and KNN(n value 3) respectively.

Afternoon, February 27, 2018 (Tuesday)

Time: 16:05-18:05

Venue: Conference Room (8th Floor)

Session 3: Topic: “Bioinformatics Engineering”

Session Chair: Prof. Haijun Zhao

H0003 Presentation 6 (17:20~17:35)

A Review of Contextual Information for Context-Based Approach in Sentiment Analysis

Nor Nadiah Yusof, Azlinah Mohamed and **Shuzlina Abdul Rahman**

Universiti Teknologi Mara, Malaysia

Abstract—Online opinionated data has increased tremendously since the arrival of web 2.0. Users have the authority to generate online content expressing their sentiments or opinions regarding subjects of interest. Although these phenomena caused the problem of information overload, the opinionated data is valuable and beneficial to others. Looking at the prominent significance of this issue, many researchers grab this opportunity to further investigate sentiment analysis. The main task of sentiment analysis is to classify opinions into several orientations. However, the orientation of sentiment is highly dependent on the context of sentiment text. Thus, it is important to consider contextual information in order to correctly classify sentiments. This paper would like to facilitate researchers in capturing the contextual information of context-based approach in sentiment analysis; which includes sequence and collocation of words, negation handling, and ambiguity. Several recent studies that utilize the contextual information are also discussed. Besides, this paper presents the state of art of context based on the level, type, and representation of context. With the help of this review, researchers will be able to correctly classify sentiments based on context in improving the performance of sentiment analyzer.

Afternoon, February 27, 2018 (Tuesday)

Time: 16:05-18:05

Venue: Conference Room (8th Floor)

Session 3: Topic: “Bioinformatics Engineering”

Session Chair: Prof. Haijun Zhao

H0008 Presentation 7 (17:35~17:50)

Improving Simplification of Support Vector Machine for Classification

Pham Quoc Thang, Hoang Thi Lam and Nguyen Thanh Thuy

Tay Bac University, Vietnam

Abstract—The efficient classification ability of support vector machines (SVMs) has been shown in many practical applications, but currently they are considerably slower in testing phase than other approaches with similar classification performance due to a large number of support vectors included in the solution. Among different approaches, simplification of support vector machine (SimpSVM) speeds-up the testing phase by replacing original SVM with a simplified one that consists of a smaller number of support vectors. However, the ultimate goal of the simplification is to keep the simplified solution as similar to the original solution as possible. To improve this similarity, in this paper, we propose two improved SimpSVMs that are based on stochastic gradient descent. Experiments on some datasets show improved results by our algorithms.

Afternoon, February 27, 2018 (Tuesday)

Time: 16:05-18:05

Venue: Conference Room (8th Floor)

Session 3: Topic: “Bioinformatics Engineering”

Session Chair: Prof. Haijun Zhao

C0018 Presentation 8 (17:50~18:05)

IoT-based Mobile Command Interface for Wildlife Emergency Response

Trung-Thanh Ngo and Dong-Seong Kim

Kumoh National Institute of Technology, South Kroea

Abstract—The natural environment along with wildlife has been damaged mainly due to the anthropogenic factors and wildlife animals are in danger of extinction and losing its natural habitat. Collecting and analyzing wildlife incidents are extremely intricate, difficult, tedious but essential tasks for wildlife researchers. Therefore, this paper presents the design and implementation of an IoT-based Mobile Command Interface for Wildlife Emergency Response (W-MERCI). We propose a smart software platform for advanced data collection to help wildlife researchers collect data more efficiently and responses more quickly to wildlife incidents. The platform can be utilized by anyone who is concerned with wildlife conservation such as tourists, biologists, researchers, and even local people. Moreover, an open-source API (Application Programming Interface) library for integrating heterogeneous animal tracking devices from different vendors into the platform is introduced.

Poster Session

February 27, 2018 (Tuesday)

Time: 09:00~18:05

Venue: Conference Room (8th Floor)

C0009 Poster 1

High-performance Ultraviolet Photodetectors Based on ZnO Nanostructures

Suttinart Noothongkaew, O. Thumthan and Ki-Seok An

Ubonratchathani University, Thailand

Abstract—Zinc Oxide nanowires were prepared on an indium tin oxide (ITO) substrate by a hydrothermal method which is renowned for its simple, low cost, and low temperature techniques. These wires prepared with different reaction times were demonstrated to be utilized as UV photodetectors. The morphology, elemental compositions, and crystallization of ZnO nanowire structures were analyzed by field emission scanning electron microscopy (FE-SEM), X-ray spectroscopy (XPS), and X-ray diffraction (XRD), respectively. The optical properties of the nanodevices were measured by using UV-vis absorption spectrometer, and the properties of UV photodetectors were characterized by I-V curves. At a given bias voltage of 5 V, ZnO nanowire devices, prepared at the reaction time of 2 h, exhibited high photocurrent, high sensitivity, and fast response time to UV illumination as compared to the devices prepared at the reaction time of 5 h. A higher surface to volume ratio is the main contribution to those properties. These results suggest that the 2-hours ZnO nanowires exhibit great promise for the highly efficient UV photodetectors.

February 27, 2018 (Tuesday)

Time: 09:00~18:05

Venue: Conference Room (8th Floor)

C0019 Poster 2

Application of Artificial Neural Network for Prescribing Nonlinear Behavior of Power Systems

Chang-Ho Hyun, Dooil Choi, Jong-Eon Lee, Youn Seop Lee and Seung-Mook Baek

Kongju National University, South Korea

Abstract—The paper describes an application of artificial neural network (ANN) in order to prescribing nonlinear patterns of power system dynamics. The power systems exhibit a mixed behavior of continuous dynamics, discrete-time and discrete-event dynamics, switching action, and so on. Nowadays, the switching facilities such as high voltage DC transmission (HVDC) and flexibly ac transmission system (FACTS) devices are installed in power system, accordingly, the complexity of power system dynamics increases. Therefore, it is hard to express the complex behavior of the power system dynamics with conventional methods based on linear analysis. On the other hand, ANN has recently attracted considerable attentions for researches of mapping mutual nonlinear behaviors between input and output signals. In the paper, the feed-forward neural network (FFNN), one of commonly used ANNs, is applied to track the nonlinear behaviors of power system which are changed according to various setting of power system controllers such as power system stabilizer (PSS) or automatic voltage regulator (AVR). By the application, the power system controllers can be optimally tuned and improve transient stability of power systems against diverse disturbances such as outage and trip/faults of some facilities.

February 27, 2018 (Tuesday)

Time: 09:00~18:05

Venue: Conference Room (8th Floor)

H0006 Poster 3

Pose VariantFace Recognition Based on Linear Mapping

Wang Dianhua, Deng Shuwen and Liao Haibin

Hubei University of Science and Technology, China

Abstract—Under uncontrolled image conditions, one of the greatest remaining research challenges in face recognition is to recognize faces across different poses. For multi-views face recognition problem either by means of difficult practical three-dimensional methods, either by means of a complex nonlinear transform algorithm. In order to overcome the poses problem, this paper analyzed the spatial change of different pose, regarded the faces with different pose space as a kind of approximate linear relationship by discretion of face pose space. As a consequence, a pose invariant face recognition method based on Orthogonal Procrustes analysis and sparse representation is proposed in this paper. Experimental results demonstrate that the presented algorithm possesses good robustness for the face variation of poses.

February 27, 2018 (Tuesday)

Time: 09:00~18:05

Venue: Conference Room (8th Floor)

C0015 Poster 4

Malware Analysis on Android using Supervised Machine Learning Techniques

Md. Shohel Rana and Andrew H. Sung

The University of Southern Mississippi, USA

Abstract—In recent years, a widespread research is conducted with the growth of malware resulted in the domain of malware analysis and detection in Android devices. Android, a mobile-based operating system currently having more than one billion active users with a high market impact that have inspired the expansion of malware by cyber criminals. Android implements a different architecture and security controls to solve the problems caused by malware, such as unique user ID (UID) for each application, system permissions, and its distribution platform Google Play. There are numerous ways to violate that fortification, and how the complexity of creating a new solution is enlarged while cybercriminals progress their skills to develop malware. A community including developer and researcher has been evolving substitutes aimed at refining the level of safety where numerous machine learning algorithms already been proposed or applied to classify or cluster malware including analysis techniques, frameworks, sandboxes, and systems security. One of the most promising techniques is the implementation of artificial intelligence solutions for malware analysis. In this paper, we evaluate numerous supervised machine learning algorithms by implementing a static analysis framework to make predictions for detecting malware on Android.

February 27, 2018 (Tuesday)

Time: 09:00~18:05

Venue: Conference Room (8th Floor)

C3005 Poster 5

Prediction of the Fourth Industrial Revolution Based on Time Series

Zhao Gang, **Zhang Guangli**, Liu Ming, Yu Shuqin Liu Yali and Yang Xiongfei

Harbin Engineering University, China

Abstract—The history of human industrial development has undergone three industrial revolutions. Based on the occurrence time sequences of the three industrial revolutions, the industrial revolution time prediction function based on quadratic function and the time prediction model based on gray GM (1,1) model are established. The prediction results show that the fourth industrial revolution will take place around 2055. Based on the new technologies, such as the Internet of things, big data, cloud computing and intelligent manufacturing, the characteristics of the fourth industrial revolution is predicted.



Dinner	
18:30-20:00	Restaurant

Conference Venue

**Headquarter building, Vietnam Academy of Science and Technology, Hanoi,
Vietnam**

Add: 8th floor, Headquarter building, Vietnam Academy of Science and Technology, Gate
18C, 18-Hoang Quoc Viet Rd, Cau Giay, Hanoi
Tel.: +84 4 38362599
Fax: +84 4 38363144
Email: admin@ibt.ac.vn



The Institute of Biotechnology (IBT) of the Vietnam Academy of Science and Technology (VAST) is the national leading research institution in the field of bioscience and biotechnology. The main activities are research and development in gene technology, animal cell biotechnology, plant cell biotechnology, biotechnology of microorganisms, protein and enzyme technology, environmental biotechnology, marine biotechnology, biomaterials technology, bionanotechnology, medical biotechnology, bioinformatics and other related fields. IBT carries out transfer and application of new scientific and technological achievements. IBT participate in the enterprise and production organization, consulting, and providing services in biotechnology and other related fields. IBT work for contribution to the establishment and

development of bioindustry in Vietnam.

Route: 30 minutes and 1 hour from the Noibai International airport to the conference venue by taxi and bus. The Headquarter building is behind the main-gate (gate 18C) of VAST.

One Day Visit & Tour

February 28, 2018 (Wednesday) 9:30~17:30

(Tip: Please arrive at the Lobby before 9:30 a.m. and wear the formal clothes. The following places are for references, and the final schedule should be adjusted to the actual notice.)

1. (9:30) Assemble at the Conference Room (8th Floor).

2. (10:00-12:00) Visit Institute of Biotechnology.

Addr: 18 Hoang Quoc Viet Rd., Cau Giay Dist., Hanoi; Belong to Vietnam academy of Science and Technology.



Institute of Biotechnology

The Institute covers all relevant aspects in gene technology, animal cell biotechnology, plant cell biotechnology, biotechnology of microorganisms, protein and enzyme technology, environmental biotechnology, marine biotechnology, biomaterials technology, bionanotechnology, medical biotechnology, bioinformatics;

IBT involves in technology transfer in biotechnology and participates in the enterprise and production;

IBT consults and provides services in biotechnology and other related fields for development of bioindustry in Vietnam;

IBT trains high quality human resources in both the postgraduate (Master, PhD.) and undergraduate levels in bioscience and biotechnology and also provides information, consulting and services for upgrading training and qualification;

IBT implements international collaborations in biology, biotechnology and other related fields, participates in international exchange programs sending staffs and young scientists for short- and long term qualifications (practical research stays, master and PhD degree studies and postdocs), and organizes international conferences and workshops.

3. (12:00-13:30) Have Lunch.

4. (13:30-17:00) Visit Hanoi.



Temple of Literature (Van Mieu-Quoc Tu Giam)

The very first stop-over of any foreign tourist in Hanoi is always Van Mieu-Quoc Tu Giam (translated as Temple of Literature), which reveals the Hanoians' spirit of study in the past!

Situated at the south of Thang Long citadel, is on top of the historical and beautiful sightseeings of the beautiful capital of Vietnam. Please follow us in a brief tour of exploring his beauty and deep values;

Tourists now flock to the site for taking a look into its profound traditional meanings of both a Confucion temple and the first university of Vietnam. Văn Miếu or Temple of Literature, known as "pagode des Corbeaux" during the period of French colonisation, was founded as a Confucian temple in 1070.

Being an ancient school of Thang Long and the first university in Vietnam, Temple of

Literature is acknowledged as an ancient historical-cultural heritage which gives tourists deeper understanding about Hanoi's years of culture and tradition. Coming here, tourists might see many Vietnamese students visiting the places as a ritual for good luck before they enter an important exam such as the entrance exam into college.



One-Pillar Pagoda (Chùa Một Cột)

The One Pillar Pagoda (Vietnamese:Chùa Một Cột, formally Diên Hựu tự, which literally means “long lasting happiness and good luck”) is a historic Buddhist temple in Hanoi, the capital of Vietnam.

According to legend, ageing Emperor Ly Thai To of the Ly dynasty, who had no children, used to go to pagodas to pray to Buddha for a son. One night, he dreamt that he was granted a private audience to the Bodhisattva Avalokiteshvara, who was seated on a great lotus flower in a square-shaped lotus pond on the western side of Thang Long Citadel, gave the King a baby boy. Months later, when the Queen gave birth to a male child, the Emperor ordered the construction of a pagoda supported by only one pillar to resemble the lotus seat of his dream in the honour of the Bodhisattva Avalokiteshvara.

What you see today of the pagoda is a new form recovered in 1955 when it was refurbished with a concrete pillar from its remnants by the Vietnamese government. Today's structure can be just called the replica of the original pagoda, which was a large building. Locals believe that if you pray here, it will invoke well-beings and prosperity.

5. (17:30) Back to the IBT.



Feedback Information

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

Personal Information					
Conference Name and Paper ID					
Full Name					
E-mail Address					
Area of Research					
Affiliation					
Please indicate your overall satisfaction with this conference with “√”					
	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
Conference Content					
Presentation and Paper Value					
Registration Process					
Venue					
Food and Beverage					
Are You A Member of CBEES	Yes <input type="checkbox"/> No <input type="checkbox"/> (If “No”, you may apply membership from http://www.cbees.org/member.htm)				
Do You Willing to Receive CBEES Future Conferences Information Via E-mail	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Where did you get the conference information?					
Would you please specify the main reason for attending this conference?					
Did the conference fulfill your reason for attending?	Yes– Absolutely <input type="checkbox"/> Yes- But not to my full extent <input type="checkbox"/> No <input type="checkbox"/> (If “No”, please tell us the main reason)				

2018 CBEES-BBS HANOI, VIETNAM CONFERENCE

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

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