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## WELCOME MESSAGE

Dear Participants,

Welcome to *Shanghai, China!* Welcome to participate in 2019 International Conference on Pattern Recognition and Intelligent Systems (PRIS 2019) and 2019 Workshop on Pattern Recognition Applications (PRA 2019). PRIS 2019 and PRA 2019 are organized by Asia Pacific Institute of Science and Engineering (APISE). All the accepted papers will be included in the volume of Journal of Physics: Conference Series (JPCS)(ISSN: 1742-6588), which will be indexed by Ei Compendex, SCOPUS, Inspec and other databases.

PRIS 2019 and PRA 2019 aim to present the latest research and results of scientists related to Pattern Recognition, Intelligent Systems, Pattern Recognition Applications and other topics. This conference provides opportunities for the delegates to exchange new ideas face-to-face, to establish business or research relations as well as to find global partners for future collaborations. We hope that the conference results will lead to significant contributions to the knowledge in these up-to-date scientific fields.

We would like to thank our outstanding Keynote Speakers: Prof. Majid Ahmadi, University of Windsor, Canada; Prof. Yiu-ming Cheung, Hong Kong Baptist University, HK for sharing their deep insights on future challenges and trends in Pattern Recognition and Intelligent Systems.

We would like to thank all the committees for their great support on organizing the conference. We also would like to thank all the reviewers for their great effort on reviewing the papers submitted to PRIS 2019 and PRA 2019. Special thanks to all the researchers and students who with their work and participate in the conference.

We hope you enjoy the conference, the food, the hospitality, and the beautiful and charming city of Shanghai.

Conference Organizing Committee



## CONFERENCE VENUE AND TRANSPORT INFORMATION

### Jinjiang Metropolo Hotel (上海锦江白玉兰宾馆)



Address: No. 1251, Siping Road, Yangpu District, Shanghai (上海市杨浦区四平路 1251 号)

#### Transportation Recommended:

1 From Shanghai Pudong International Airport, take taxi about 45 minutes, take subway about 1.5 hours; Route: Subway line 2 east extension → metro line 2 → subway line 10 (get off at Tongji university station (5 exit))

2 From Shanghai Hongqiao international airport or Shanghai Hongqiao Railway Station, take taxi about 50 minutes, take subway about 55 minutes; Route: subway line 10 (get off at Tongji university station (5 exit))

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## INTRODUCTION TO CONFERENCE SPEAKERS

### Keynote Speaker 1



**Prof. Majid Ahmadi**

University of Windsor, Canada

**Biography:** Majid Ahmadi received the B.Sc. degree in electrical engineering from the Sharif University, Tehran, Iran, in 1971 and the Ph.D. degree in electrical engineering from Imperial College of Science, Technology and Medicine, London, U.K., in 1977.

He has been with the Department of Electrical and Computer Engineering, University of Windsor, Windsor, Ontario, Canada, since 1980, currently as Distinguished University Professor and Associate Dean of Engineering for Research and Graduate Studies. His research interests include digital signal processing, machine vision, pattern recognition, neural network architectures, applications, and VLSI implementation, computer arithmetic, and Memristor based digital circuit design.

He has co-authored the book *Digital Filtering in 1-D and 2-Dimensions; Design and Applications* (New York: Plenum, 1989) and has published over 600 articles in these areas. He has served on the editorial board for the *Journal of Circuits, Systems and Computers* as an Associate Editor and Regional Editor from 1992 to 2012, an Associate Editor for the *Journal of Pattern Recognition* since 1992.

Dr. Ahmadi was the IEEE-CAS representative on the Neural Network Council and the Chair of the IEEE Circuits and Systems Neural Systems Applications Technical Committee (2000). He was a recipient of an Honorable Mention award from the Editorial Board of the *Journal of Pattern Recognition* in 1992 and received the Distinctive Contributed Paper award from the Multiple-Valued Logic Conference Technical Committee and the IEEE Computer Society in 2000. He was recipient of the best paper award from 2011 IEEE International Electro/Information Technology Conference. He was recipient of the best paper award from the 2015 International Conference on Systems, Barcelona, Spain, in April 19-24, 2015. Recipient of WAC'2016 Lifetime Achievement Award for outstanding contributions to "Digital Filtering, Signal and Image Processing and Machine Vision" in August 2, 2016, Rio Grande, Puerto Rico. Recipient of the IJCNN 2017 Best Poster Honorable Mention for the paper "STDP-based Unsupervised Learning of Memristive Spiking Neural Network by Morris-Lecar Model" by A. Amirsoleimani, M.Ahmadi, A. Ahmadi

Dr. Ahmadi was awarded Distinguished University Professorship in 2003, Faculty of Engineering Dean's Special Recognition Award in 2007, and University of Windsor Award for Excellence in Scholarship, Research and Creative Activity in 2008. He is a Fellow IET (U.K) and Fellow IEEE (USA).

**Speech title: Human Face Recognition; Challenges, Achievements and New Trends**

**Abstract:** Face recognition is widely used as an efficient biometric identification technique

which is applied to recognize an unknown individual by analyzing and comparing their facial image to the available database of known identities. It has a wide range of applications such as social networking, border monitoring, access control and law enforcement. The accuracy of face recognition is affected by variation in the appearance of face due to poor illumination, head pose, facial expression, partial occlusion, blur, aging or other degradation. In recent years, many identification techniques were proposed in order to increase the accuracy of recognition versus appearance changes, poor illumination, occlusion and blur. In holistic based approaches the whole face area is employed to extract features and deciding on the identity label. Local Approaches capture the underlying image structure by describing only local parts of the image. In this talk a review of the effectiveness of pre-processing algorithms is presented. A comparison of holistic as well as local techniques is presented. Challenges faced with either technique explained and some improvements are suggested. Techniques to combat poor illumination and occlusion are discussed. Fusion of classifiers to improve the recognition rate is presented. Some new trends in human face recognition are discussed.

## Keynote Speaker 2



**Prof. Yiu-ming Cheung**

Hong Kong Baptist University, HK

**Biography:** Yiu-ming Cheung received Ph.D. degree from Department of Computer Science and Engineering at The Chinese University of Hong Kong in 2000. He joined the Department of Computer Science in Hong Kong Baptist University (HKBU) in 2001, and became a full professor since 2012. He is an IEEE Fellow, IET/IEE Fellow, British Computer Society (BCS) Fellow, Fellow of the Royal Society of Arts (RSA), and IETI Distinguished Fellow, as well as the recipient of “Chu Tian Scholars” in China. His research interests include machine learning, pattern recognition, image and video processing, and optimization. He has published over 220 articles in the high-quality conferences and journals, including IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Image Processing, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on SMC (Part B), and so on. His co-authored work on multi-modal optimization won the championship in the competition of Multi-Niche Optimization held in CEC’2015 --- a flagship international conference on Evolutionary Computation. Moreover, he has been granted one Chinese patent and two US patents. In particular, selected from 1000 new inventions and products of 700+ competition teams from 40 countries, he was awarded two most prestigious prizes: (1) the Gold Medal with Distinction (i.e. the highest grade in Gold Medals) and (2) Swiss Automobile Club Prize, in the 45th International Exhibition of Invention, Geneva, Switzerland, on March 29-April 2, 2017, in recognition of his innovative work. Also, he was the Gold Award Winner of Hong Kong Innovative Invention Award in the Seventh Hong Kong Innovative Technologies Achievement Award 2017. In addition, he won the Gold Medal with Congratulations of Jury (i.e. the highest grade in Gold Medals) and the Award of Excellence from Romania, respectively, at the 46th International Exhibition of Inventions of Geneva 2018. Prof. Cheung was the recipient of 2011 Best Research Award in Department of Computer Science, HKBU, the recipient of Best Paper Awards in SEAL’2017, ISICA’2017, ICNC-FSKD’2014, and IEEE IWDVT’2005, respectively, and the recipient of 2017 IETI Annual Scientific Award. He is the Founding and Past Chairman of IEEE (Hong Kong) Chapter of Computational Intelligence Society, and the Chair of IEEE Computer Society Technical Committee on Intelligent Informatics. Furthermore, he has taken the key positions in several top-tier international conferences, e.g. Senior Program Committee Member of IJCAI-ECAI’2018, Area Chair of ICDM’2017 and ICDM’2018, Program Committee Chair of WI’2012 and IAT’2012, Organizing Committee Chair of WI’06, IAT’06, ICDM’06, etc. He has served as the Guest Editor / Associate Editor in several prestigious international journals, including: IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Cybernetics, Pattern Recognition, Neurocomputing, and Knowledge and Information Systems: An International Journal, to name a few.

**Speech title: Class Imbalance Learning in Big Data Analytics**

**Abstract:** In many practical problems, number of data form difference classes can be quite imbalanced, which could make the performance of the most machine learning methods become deteriorate to a certain degree. As far as we know, the problem of learning from imbalanced data continues to be one of the challenges in the field of data engineering and machine learning, which has attracted growing attentions in recent years. In this talk, we will first formally describe the class imbalance problem and its significance with examples from real world applications, and review the existing solutions. Then, two research problems, i.e. classifier weights of boosting and imbalanced streaming data with concept drift, are studied. Accordingly, we have proposed a solution for each problem. Finally, some challenging problems in this topic are explored as well.

## Invited Speaker 1



**Prof. Jun Wang**

University of Central Florida, Orlando, FL, USA

**Biography:** Dr. Jun Wang is a Full Professor of Computer Engineering; and Director of the Computer Architecture and Storage Systems (CASS) Laboratory at the University of Central Florida, Orlando, FL, USA. He received his Ph.D. in Computer Science and Engineering from University of Cincinnati in 2002. He is the recipient of National Science Foundation Early Career Award 2009 and Department of Energy Early Career Principal Investigator Award 2005. He has authored over 120 publications in premier journals such as IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, and leading HPC and systems conferences such as VLDB, HPDC, EuroSys, IPDPS, ICS, Middleware, FAST. He has conducted extensive research in the areas of Computer Systems and High Performance Computing. His specific research interests include massive storage and file System in local, distributed and parallel systems environment. His group has secured more than 5+ million dollars federal research fundings in last five years. At present, his group is investigating three US National Science Foundation projects, one DARPA and one NASA project. He has graduated 13 Ph.D. students who upon their graduations were employed by major US IT corporations (e.g., Google, Microsoft, etc). He has served as numerous US NSF grant panelists and US DOE grant panelists and TPC members for many premier conferences. In 2019, he won IEEE Transactions on Cloud Computing Editorial Excellence and Eminence (EEE) award. He has been serving on the editorial board for the IEEE transactions on parallel and distributed systems, and IEEE transactions on cloud computing. He is a general executive chair for IEEE DASC/DataCom/PIcom/CyberSciTech 2017, and has co-chaired technical programs in numerous computer systems conferences including the 2018 IEEE international conference on High Performance Computing and Communications (HPCC18), the 10th IEEE International Conference on Networking, Architecture, and Storage (NAS 2015), and 1st International Workshop on Storage and I/O Virtualization, Performance, Energy, Evaluation and Dependability (SPEED 2008) held together with HPCA.

His specific research interests include:

Big Data and Big Compute Systems

Data-intensive High Performance Computing

Massive Storage and File System

I/O Architecture

**Speech title: Deep feature based on convolutional auto-encoder for compact semantic hashing**

**Abstract:** For content-based image retrieval, a good presentation is crucial. Nowadays, as

deep learning models can be used to generate an excellent presentation, it has been extensively investigated and widely used in research systems and commercial production systems. However, the deep representation (deep feature) is still too large. Compared with directly using deep representation, binary code can reduce significant storage overhead. Meanwhile, the bit-wise operations for binary code can dramatically fasten the computation. There exist some schemes used to convert the deep feature to binary code, but all of them directly applied the last layer of the connection layers, which exhibit global feature and discriminating features. To achieve deep generative feature and avoid destroying the image locality, we aim to construct the binary hash code based on convolutional auto-encoders. Namely, we use the generative model to transform the local feature to binary code. The training process of our proposed model is decomposed into three stages. Firstly, the convolutional layers are trained using convolutional autoencoders, followed by the fully-connected layers training using Restricted Boltzmann Machine. Thirdly, we deploy a supervised similarity learning algorithm to learn close code for similar images.

## Invited Speaker 2



**Prof. Yasuhiro Matsuda**

Kanagawa Institute of Technology, Japan

**Biography:** Prof. Yasuhiro Matsuda obtained his Ph.D. degree from the University of Tokyo in 2007. He joined the Department of Welfare Systems Engineering at Kanagawa Institute of Technology in 2000, and later joined the Department of Robotics and Mechatronics. Now, he is a professor and department chair of the Department of Clinical Engineering. Prof. Matsuda's expertise is in the field of assistive technology for deaf and/or blind persons and measurement engineering. Currently, his main research interest is in the development of the communication support system using Finger Braille for deafblind person and tactual communication tool for elderly person.

**Speech title: Emotion Teaching Interfaces using Emoticons and Emojis for Finger Braille Emotion Teaching System**

**Abstract:** Some deafblind persons utilize Finger Braille, a communication medium using tactile sense, to communicate each other. Deafblind persons can communicate words, if they are trained in Finger Braille, and also communicate varied emotions by Finger Braille. In this work, the emojis and emoticons were applied to the emotion teaching interfaces in order to develop Finger Braille emotion teaching system. Two novel emojis for joy, anger and sadness were selected, respectively. The best depicted emoticons for joy, anger and sadness were also selected, respectively. Then we designed six emotion teaching interfaces with the emojis and three ones with the emoticons. We conducted the evaluation experiment which evaluate the associable emotion teaching interfaces for joy, anger and sadness, respectively. As a result, the emojis Anger D and Sadness D were associated the best with anger and sadness, respectively; the emoticon Joy 1 was associated the best with joy.

## **INSTRUCTIONS TO PRESENTATIONS**

### **Devices Provided by the Conference Organizer:**

Laptops (with MS-Office & Adobe Reader)  
Projectors & Screen  
Laser Sticks  
Tape

### **Materials Provided by the Presenters:**

Oral Presenter:  
PowerPoint or PDF files  
Duration of each Presentation (Tentatively)

Poster Presenter:  
Poster: 0.8m\*1m; color printing; Add Conference Name's Acronym on the top of poster (Such as "PRIS 2019")

### **Minutes of Q&A**

Keynote Speech: 40 Minutes of Presentation (including Q&A)  
Invited Speech: 35 Minutes of Presentation (including Q&A)  
Presenter: 12-15 Minutes of Presentation (including Q&A)

### **NOTICE:**

- Certificate of Participation will be awarded by Session Chair after each presentation finished.
- The organizer will not provide accommodation, so we suggest you make an early reservation.
- One best presentation will be selected from each session. The best one will be announced when each session ends, and will be awarded by the session chair after each session in the meeting room.
- The attendee should provide the Confirmation Letter of Attendance when register.

# PRIS 2019 CONFERENCE PROGRAM OVERVIEW

Mar.22	<b>Registration</b>										
	14:00 - 17:00										
	Registration and Conference kits collection Hotel Lobby										

Mar.23	Opening Ceremony	Keynote Speech & Invited Speech Session					Lunch	Oral & Poster Presentation Session			Dinner
	8:50-9:00	9:00-9:40	9:40-10:20	10:20-10:50	10:50-11:25	11:25-12:00	12:00-14:00	14:00-16:15	16:15-16:40	16:40-18:00	18:00-19:00
		<b>Keynote Speech 1</b> Prof. Majid Ahmadi	<b>Keynote Speech 2</b> Prof. Yiu-ming Cheung	<b>Coffee Break</b> <hr/> <b>Group Photo</b>	<b>Invited Speech 1</b> Prof. Jun Wang	<b>Invited Speech 2</b> Prof. Yasuhiro Matsuda	Chinese Restaurant	<b>Oral Presentation Session</b>	<b>Coffee break</b>	<b>Poster Presentation Session</b>	Chinese Restaurant

**15F, Guoji Multi-Functional Hall**

Mar.24	<b>Technical Tour(Pending)</b>										
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## SESSION OVERVIEW

<b>Keynote Speech Session</b> <b>Mar.23, 2019</b>  <b>8:50-10:20</b> (15 F, GUOJI MULTI-FUNCTIONAL HALL)	<b>Keynote Speaker 1</b> Prof. Majid Ahmadi	Human Face Recognition; Challenges, Achievements and New Trends
	<b>Keynote Speaker 2</b> Prof. Yiu-ming Cheung	Class Imbalance Learning in Big Data Analytics
<b>10:20-10:50</b>	<b>Coffee Break &amp; Group Photo</b>	
<b>Invited Speech Session</b> <b>Mar.23, 2019</b>  <b>10:50-12:00</b> (15 F, GUOJI MULTI-FUNCTIONAL HALL)	<b>Invited Speaker 1</b> Prof. Jun Wang	Deep feature based on convolutional auto-encoder for compact semantic hashing
	<b>Invited Speaker 2</b> Prof. Yasuhiro Matsuda	Emotion Teaching Interfaces using Emoticons and Emojis for Finger Braille Emotion Teaching System
<b>12:00-14:00</b>	<b>Lunch</b>	
<b>Oral Presentation Session</b> <b>Mar.23, 2019</b> <b>14:00-16:15</b> (15 F, GUOJI MULTI-FUNCTIONAL HALL)	<b>P1001</b> Maorui Wang	Image completion based on GANs with a new loss function
	<b>P1002</b> Ivo Düntsch	Confusion matrices and rough set data analysis
	<b>P1007</b> Chen Xu	A Novel Information Integration Algorithm for Speech Recognition System: Basing on Adaptive Clustering and Supervised State of Acoustic Feature
	<b>P1015</b> Sukun Li	Feature Extraction Method for EEG based Biometrics
	<b>P1017</b> Sujittra Sa-ngiem	Cerebral Microbleed Detection by Extracting Area and Number from Susceptibility Weighted Imagery using Convolutional Neural Network
	<b>P1023</b> BOUTOUHAMI Khaoula	An Argumentation-Based Approach for Computing Inconsistency Degree in Possibilistic Lightweight Ontologies
	<b>P2001</b> Xiaorong Huang	Deeper time delay neural networks for effective acoustic modelling
	<b>P2008</b> Md Rezwan Hasan	Face Anti-Spoofing using Texture-Based Techniques and Filtering Methods

	<b>P1022(Video)</b> Ari Ernesto Ortiz Castellanos	Mobile Detection Using 2D and 3D Basic Geometric Figure in Colour and Grayscale
<b>16:15-16:40</b>	<b>Coffee break</b>	
<b>Poster Presentation Session Mar.23, 2019 16:40-18:00 (15 F, GUOJI MULTI-FUNCTIONAL HALL)</b>	<b>P1006</b> Miaomiao Li	A method of license plate recognition based on BP neural network with median filtering
	<b>P1013</b> Shihui Gao	DCRN: Densely Connected Refinement Network for Object Detection
	<b>P1014</b> Shengbo Wang	Action Keyframe Connection Network for Temporal Action Proposal Generation
	<b>P1016</b> Ziming Lu	Metric Learning Based Rolling Bearing Faults Diagnosis with Curvelet Transform
	<b>P1018</b> Ruyi Zhang	Video Object Detection by aggregating features across adjacent frames
	<b>P1019</b> Qingyu Li	Light Corner Based Object Detector with Stacked-ENet Backbones
	<b>P1020</b> Tianyu Zhou	Iterative Relation Reasoning for Multiple Object Recognition
	<b>P1024</b> Zhang Yue	Atrial fibrillation detection based on EEMD and XGBoost
	<b>P1025</b> Zhang Zhijia	Detection and implementation of driver's seatbelt based on FPGA
	<b>P2002</b> Kaibin Chen	Gated Time Delay Neural Network for Speech Recognition
	<b>P2003</b> Boji Liu	Time Delay Recurrent Neural Network For Speech Recognition
	<b>P2005</b> Zhifeng Xie	A COMPARISON OF FEATURES FOR REPLAY ATTACK DETECTION

## FULL SCHEDULE

<b>Registration</b> <b>March 22, 2019 Friday</b> <b>14:00 -17:00</b> <b>Hotel Lobby, Jinjiang Metropolo Hotel</b>	
<b>14:00 -17:00</b>	Participants Registration and Conference kits Collection

<b>Keynote Speech Session &amp; Invited Speech Session</b> <b>March 23, 2019 Saturday</b> <b>8:00-12:00</b> <b>15F, GUOJI MULTI-FUNCTIONAL HALL, Shanghai, China</b>	
<b>8:50 - 9:00</b>	<b>Opening Ceremony</b>
<b>9:00 - 9:40</b> <b>Keynote Speech 1</b>  Prof. Majid Ahmadi University of Windsor, Canada	<p><b>Title of Speech:</b> Human Face Recognition; Challenges, Achievements and New Trends</p> <p><b>Abstract:</b> Face recognition is widely used as an efficient biometric identification technique which is applied to recognize an unknown individual by analyzing and comparing their facial image to the available database of known identities. It has a wide range of applications such as social networking, border monitoring, access control and law enforcement. The accuracy of face recognition is affected by variation in the appearance of face due to poor illumination, head pose, facial expression, partial occlusion, blur, aging or other degradation. In recent years, many identification techniques were proposed in order to increase the accuracy of recognition versus appearance changes, poor illumination, occlusion and blur. In holistic based approaches the whole face area is employed to extract features and deciding on the identity label. Local Approaches capture the underlying image structure by describing only local parts of the image. In this talk a review of the effectiveness of pre-processing algorithms is presented. A comparison of holistic as</p>

	<p>well as local techniques is presented. Challenges faced with either technique explained and some improvements are suggested. Techniques to combat poor illumination and occlusion are discussed. Fusion of classifiers to improve the recognition rate is presented. Some new trends in human face recognition are discussed.</p>
<p><b>9:40 - 10:20</b> <b>Keynote Speech 2</b></p>  <p>Prof. Yiu-ming Cheung Hong Kong Baptist University, HK</p>	<p><b>Title of Speech:</b> Class Imbalance Learning in Big Data Analytics</p> <p><b>Abstract:</b> In many practical problems, number of data form difference classes can be quite imbalanced, which could make the performance of the most machine learning methods become deteriorate to a certain degree. As far as we know, the problem of learning from imbalanced data continues to be one of the challenges in the field of data engineering and machine learning, which has attracted growing attentions in recent years. In this talk, we will first formally describe the class imbalance problem and its significance with examples from real world applications, and review the existing solutions. Then, two research problems, i.e. classifier weights of boosting and imbalanced streaming data with concept drift, are studied. Accordingly, we have proposed a solution for each problem. Finally, some challenging problems in this topic are explored as well.</p>
<p><b>10:20 - 10:50</b></p>	<p><b>Coffee Break and Group Photo</b> </p>
<p><b>10:50 - 11:25</b> <b>Invited Speech 1</b></p>  <p>Prof. Jun Wang University of Central Florida, Orlando, FL, USA</p>	<p><b>Title of Speech:</b> Deep feature based on convolutional auto-encoder for compact semantic hashing</p> <p><b>Abstract:</b> For content-based image retrieval, a good presentation is crucial. Nowadays, as deep learning models can be used to generate an excellent presentation, it has been extensively investigated and widely used in research systems and commercial production systems. However, the deep representation (deep feature) is still too large. Compared with directly using deep representation, binary code can reduce significant storage overhead. Meanwhile, the bit-wise operations for binary code can dramatically fasten the computation. There exist some schemes used to convert the deep feature to binary code, but all of them directly applied the last layer of the connection layers, which exhibit global feature and discriminating features. To achieve deep generative feature and avoid destroying the image locality, we aim to construct the binary hash code based on convolutional auto-encoders. Namely, we use the generative model to transform the local feature to binary code. The training process of our proposed model is decomposed into three stages. Firstly, the convolutional layers are trained using convolutional autoencoders,</p>

	followed by the fully-connected layers training using Restricted Boltzmann Machine. Thirdly, we deploy a supervised similarity learning algorithm to learn close code for similar images.
<b>11:25 - 12:00</b> <b>Invited Speech 2</b>  Prof. Yasuhiro Matsuda Kanagawa Institute of Technology, Japan	<p><b>Title of Speech:</b> Emotion Teaching Interfaces using Emoticons and Emojis for Finger Braille Emotion Teaching System</p> <p><b>Abstract:</b> Some deafblind persons utilize Finger Braille, a communication medium using tactile sense, to communicate each other. Deafblind persons can communicate words, if they are trained in Finger Braille, and also communicate varied emotions by Finger Braille. In this work, the emojis and emoticons were applied to the emotion teaching interfaces in order to develop Finger Braille emotion teaching system. Two novel emojis for joy, anger and sadness were selected, respectively. The best depicted emoticons for joy, anger and sadness were also selected, respectively. Then we designed six emotion teaching interfaces with the emojis and three ones with the emoticons. We conducted the evaluation experiment which evaluate the associable emotion teaching interfaces for joy, anger and sadness, respectively. As a result, the emojis Anger D and Sadness D were associated the best with anger and sadness, respectively; the emoticon Joy 1 was associated the best with joy.</p>
<b>12:00-14:00</b>	<b>Lunch</b> 
<b>Oral Presentation Session</b> <b>March 23, 2019 Saturday</b> <b>14:00-16:15</b> <b>Session Chair: Prof. Majid Ahmadi</b> <b>15F, GUOJI MULTI-FUNCTIONAL HALL</b>	
<b>P1001</b>	<p><b>Presenter:</b> Maorui Wang</p> <p>School of Software Engineering, Chongqing University of Posts and Telecommunications, China; Chongqing Software Quality Assurance System Engineering Technology Research Center, China</p> <p><b>Title:</b> Image completion based on GANs with a new loss function</p> <p><b>Authors:</b> Ying Huang, Maorui Wang, Ying Qian, Shuohao Lin and Xiaohan Yang</p>

	<p><b>Abstract:</b> Recently, many approaches based on deep learning have demonstrated amazing capabilities in varieties of challenging image tasks, such as image classification, object detection, semantic and instance segmentation, and so on. These methods are more capable of extracting deeper features than traditional methods, which is critical for different kinds of image tasks. Similarly, these methods are gradually applied to the work of image completion of natural images. In consideration of the fact that most of the current methods would lead to blurring and fake results, we propose an image completion method based on the generation adversarial network. We use the network structure of the encoder and decoder to obtain the high-level feature information of the image and generate reasonable pixel values to fill the missing regions. Besides, we construct a new joint loss function based on SSIM evaluation indicators, which can retain the similarity between two images as much as possible. Our proposed method can keep the completion regions consistent with the surrounding pixels, which makes the images look more realistic. We evaluate on our datasets with our proposed method and compare with other methods in this paper, our results are sharper and more realistic than the previous ones.</p>
<p><b>P1002</b></p>	<p style="text-align: center;"><b>Presenter:</b> Ivo Düntsch</p> <p style="text-align: center;">College of Mathematics and Informatics, Fujian Normal University, Fuzhou, China</p> <p><b>Title:</b> Confusion matrices and rough set data analysis</p> <p><b>Authors:</b> Ivo Düntsch and Günther Gediga</p> <p><b>Abstract:</b> A widespread approach in machine learning to evaluate the quality of a classifier is to cross-classify predicted and actual decision classes in a confusion matrix, also called error matrix. A classification tool which does not assume distributional parameters but only information contained in the data is based on rough set data model which assumes that knowledge is given only up to a certain granularity. Using this assumption and the technique of confusion matrices, we define various indices and classifiers based on rough confusion matrices.</p>
<p><b>P1007</b></p>	<div style="text-align: center;">  <p><b>Presenter: Chen Xu</b></p> <p>Department of Electronic Engineering, Tsinghua University, China</p> </div>

	<p><b>Title:</b> A Novel Information Integration Algorithm for Speech Recognition System: Basing on Adaptive Clustering and Supervised State of Acoustic Feature</p> <p><b>Authors:</b> Chen Xu and Xi Xiao</p> <p><b>Abstract:</b> When utilizing the most likely state sequence (MLSS) criterion in Gauss mixture model-hidden Markov model (GMM-HMM) to acquire the best state series of observations, only the maximum likelihood state of speech frame is considered. Therefore, the influence of other states is neglected, which leads to the losing of some important information, and further reduces the recognition rate of the system. In this paper, we propose two new features, which are called state likelihood cluster feature (SLCF) and supervised state feature (SSF), to both reflect acoustic features and fuse state information. Combining SLCF and SSF with Mel frequency cepstrum coefficient (MFCC), Mel frequency cepstrum &amp; state likelihood cluster feature (MSLCF) and Mel frequency cepstrum &amp; supervised state feature (MSSF) are formed, respectively. By the proposed MSLCF and MSSF in Chinese speech recognition experiment, the relative error rate of the isolated word recognition system declines 6.10% and 9.66%, respectively, and the relative error rate of the continuous speech recognition system declines 2.53% and 11.05%, respectively.</p>
<p><b>P1015</b></p>	<p><b>Presenter:</b> Sukun Li</p> <p>Department of Computer Science, Pace University, New York, NY, 10038, USA</p> <p><b>Title:</b> Feature Extraction Method for EEG based Biometrics</p> <p><b>Authors:</b> Sukun Li and Sung-Hyuk Cha</p> <p><b>Abstract:</b> Distinct feature extraction methods are simultaneously used to describe single channel EEG-based biometrics. This study proposes a new strategy to extract features from the EEG signals. Based on the time and frequency domain parameters of the EEG, the statistics and entropy features are obtained and then transformed as distance features with a dichotomy algorithm. For the dichotomize process, the support vector machine classifier is used with 10-cross-fold in this research. The main contribution of this paper is to propose a simple but effective single-channel EEG feature extraction method, and consider feature selection to optimize classification efficiency. In the experiments, the EEG data is used in a biometric authentication system when the subject is in a non-stationary state with different emotions. The results show that our method achieves better classification performance on the AF3 channel than previous work.</p>

<p><b>P1017</b></p>	<div data-bbox="874 203 1061 394" data-label="Image"> </div> <p><b>Presenter:</b> Sujittra Sa-ngiem</p> <p>College of Computing, Prince of Songkla University Phuket Campus, Thailand</p> <p><b>Title:</b> Cerebral Microbleed Detection by Extracting Area and Number from Susceptibility Weighted Imagery using Convolutional Neural Network</p> <p><b>Authors:</b> S Sa-ngiem, K Dittakan and K Temkiatvises</p> <p><b>Abstract:</b> Cerebral microbleed (CMB) the small vessels in the brain which is one of the major factors used to facilitate in the early stage diagnosis for Alzheimer's disease detection. In traditional, CMBs detection can be done manually by the neurologists, doctors or specialists. However, the process is time-consuming and the results are not accurate depending on the doctor experiences. Therefore the efficient and reliable of the automatic detection of CMB is needed. This paper proposes a new framework for CMB detection which employs segmentation of the region of interests (ROIs), detection of the CMBs and identification of the area from SWI scan images. Convolutional Neural Network (CNN) is applied to generate the desired models for later prediction. Shape matching mechanism is also applied to identify locations of CMB in the brain. The experimental result shows that the CMB can be classified with a recorded accuracy value of 96.27%. The CMBs were discovered from three different locations include (i) cortical region, (ii) cerebellum and (iii) brainstem with an accuracy value of 95.14%.</p>
<p><b>P1023</b></p>	<div data-bbox="887 1518 1050 1731" data-label="Image"> </div> <p><b>Presenter:</b> BOUTOUHAMI Khaoula</p> <p>School of Computer Science and Engineering, Southeast University, Nanjing, China</p> <p><b>Title:</b> An Argumentation-Based Approach for Computing Inconsistency Degree in Possibilistic Lightweight Ontologies</p>

	<p><b>Authors:</b> Khaoula boutouhami and Ibrahim Hussein Musa</p> <p><b>Abstract:</b> An important feature of the argument theory is that it is able to trait inconsistent information naturally. In this paper, we are interested in the use of argumentation for computing the inconsistency degree of uncertain knowledge bases expressed in min-based possibilistic DL-Lite (the key notion in reasoning from a possibilistic DL-Lite knowledge base). without calculating the negative closure. In the present work the uncertainty is only considered at the assertional based (ABox) level. We proved that it is coherent and feasible to use Dung's abstract argumentation theory to compute the inconsistency degree.</p>
<p><b>P2001</b></p>	<div data-bbox="884 723 1050 920" data-label="Image"> </div> <p><b>Presenter:</b> Xiaorong Huang</p> <p>South China University of Technology, China</p> <p><b>Title:</b> Deeper time delay neural networks for effective acoustic modelling</p> <p><b>Authors:</b> Xiaorong Huang, Weibin Zhang, Xiangmin Xu, Ruixiang Yin and Dongpeng, Chen</p> <p><b>Abstract:</b> Time delay neural networks (TDNNs) have been shown to be an efficient network architecture for modelling long temporal contexts in speech recognition. Meanwhile, the training times of TDNNs are much less, compared with other long temporal contexts models based on recurrent neural networks. In this paper, we propose deeper architectures to improve the modelling power of TDNNs. At each TDNN layer that needs spliced input, we increase the number of transforms so that the lower layers can provide more salient features for upper layers. Dropout is found to be an effective way to prevent the model from overfitting once the depth of the model is substantially increased. The proposed architectures significantly improvements the recognition accuracy in Switchboard and AMI.</p>
<p><b>P2008</b></p>	<div data-bbox="876 1834 1059 2033" data-label="Image"> </div>

	<p style="text-align: center;"><b>Presenter:</b> Md Rezwan Hasan</p> <p style="text-align: center;">Nanjing University of Science &amp; Technology, China</p> <p><b>Title:</b> Face Anti-Spoofing using Texture-Based Techniques and Filtering Methods</p> <p><b>Authors:</b> Md Rezwan Hasan, S M Hasan Mahmu and Xiang Yu Li</p> <p><b>Abstract:</b> User authentication for an accurate biometric system is the demand of the hour in today's world. When somebody attempts to take on the appearance of another person by introducing a phony face or video before the face detection camera and gets illegitimate access, a face presentation attack usually happens. To effectively protect the privacy of a person, it is very critical to build a face authentication and anti-spoofing system. This paper introduces a novel and appealing face spoof detection technique, which is primarily based on the study of contrast and dynamic texture features of both seized and spoofed photos. Valid identification of photo spoofing is anticipated here. A modified version of the DoG filtering method, and local binary pattern variance (LBPV) based technique, which is invariant to rotation, are designated to be used in this paper. Support vector machine (SVM) is used when feature vectors are extracted for further analysis. The publicly available NUAA photo-imposter database is adapted to test the system, which includes facial images with different illumination and area. The accuracy of the method can be assessed using the false acceptance rate (FAR) and false rejection rate (FRR). The results express that our method performs better on key indices compared to other state-of-the-art techniques following the provided evaluation protocols tested on a similar dataset.</p>
<b>P1022(Video)</b>	<p style="text-align: center;"><b>Presenter:</b> Ari Ernesto Ortiz Castellanos</p> <p style="text-align: center;">National Taipei University of Technology, Taiwan</p> <p><b>Title:</b> Mobile Object Detection Using 2D and 3D Basic Geometric Figures in Colour and Grayscale</p> <p><b>Authors:</b> Ari Ernesto Ortiz Castellanos</p> <p><b>Abstract:</b> In this paper, we use TensorFlow Mobile Lite for Object Detection with datasets of basic geometric figures on iOS mobile devices. Additionally, we trained 4 datasets in 2D and 3D and we compare the accuracy of detection between using colour and grayscale image data. Also, we evaluate the detection rate using 2D and 3D for some kind of normal objects in precision and label output. We used Convolutional Neural Networks (CNN) for build the datasets and OPENCV for convert into grayscale. We value the result relation</p>

	<p>between flat and volume datasets in way of label and numeric detection, also the affectation of TensorFlow Mobile with this kind of datasets. We make comparisons based on the results of the different experiments object the detection and, in this work, TensorFlow Mobile Lite implementation does not have pseudo boxes and the reason is explained for detection purposes and accuracy adjusted to this kind of experiments.</p>
<b>16:15-16:40</b>	<b>Coffee Break</b> 
<b>Poster Presentation Session</b> <b>March 23, 2019 Saturday</b> <b>16:40-18:00</b> <b>15F, GUOJI MULTI-FUNCTIONAL HALL</b>	
<b>P1006</b>	<p><b>Title: A method of license plate recognition based on BP neural network with median filtering</b></p> <p><b>Authors:</b> Miaomiao Li, Zhenjiang Miao, Jiaji Wang, Shengbo Wang and Yuanhao Zhang</p> <p><b>Abstract:</b> With the rapid increase of cars, the research of license plate recognition in intelligent traffic algorithm has attracted much attention. In this paper, pointing at the shortcomings of the existing recognition algorithm, we adopt a license plate recognition method based on BP neural network with a median filtering. The method consists of a median filtering algorithm for denoising and a BP neural network for training and testing. First the character library is processed by median filtering to remove the influence of noise. Then, utilizing the strong learning ability of BP, the character library is passed into the network for classification. Compared with the traditional algorithm, our method not only speeds up the recognition efficiency, but also obtains more robust results. Therefore, the proposed approach can provide a technical support for the practical application of license plate recognizing.</p>
<b>P1013</b>	<p><b>Title: DCRN: Densely Connected Refinement Network for Object Detection</b></p> <p><b>Authors:</b> Shihui Gao, Zhenjiang Miao, Qiang Zhang and Qingyu Li</p> <p><b>Abstract:</b> Object detection has made great progress in recent years, the two-stage approach achieves high accuracy and the one-stage approach achieves high efficiency. In order to inherit the advantages of both while improving detection performance, this manuscript</p>

	<p>present a useful method, named Densely Connected Refinement Network (DCRN). It adds the dense connection based on RefineDet. Compare to the RefineDet, our approach can take full advantage of the bottom feature information. DCRN is formed by three interconnected modules, the dense anchor refinement module (DARM), the dense object detection module (DODM) and the dense transfer connection block (DTCB). First module can make better use of the features from different layers to initially adjust anchors by attaching dense connection. The latter module takes the refined anchors to further improve the regression and predict multi-class label. Due to the dense connection in DCRN, the network parameters are reduced and the computing costs of this approach is also saved. Extensive experimental results on PASCAL VOC 2007 and PASCAL VOC 2012 demonstrate that DCRN achieves higher accuracy than the one-stage method and higher efficiency than the two-stage method.</p>
<p><b>P1014</b></p>	<p><b>Title: Action Keyframe Connection Network for Temporal Action Proposal Generation</b></p> <p><b>Authors:</b> Shengbo Wang, Zhenjiang Miao, Tianyu Zhou, Miaomiao Li, Ruyi Zhang</p> <p><b>Abstract:</b> Temporal action detection is an important research topic in computer vision, of which Temporal Action Proposal (TAP) generation is a key step for finding candidate action segments. Our paper provides an action proposal generation network for temporally untrimmed videos in which a new effective and efficient deep architecture named action keyframe connection network for temporal action proposal Generation. Firstly, a two-stream network is adopted to extract frame-level features which included appearance feature and optical flow feature. The temporal information helps the subsequent network to determine whether a frame is the beginning or the ending of the action. Secondly, a position discrimination network is designed to infer the probability of each frame being starting frame or ending frame. The network outputs a starting probability sequence and an ending probability sequence which indicates the start of the action and the end of the action respectively. Finally, our network generates a proposal by a specific threshold rule combining the points in the starting probability sequence and the ending probability sequence. We carry out experiments on ActivityNet dataset to compare our proposed method with the state-of-the-art methods. Experiment results show that our method achieves superior performance over other methods.</p>
<p><b>P1016</b></p>	<p><b>Title: Metric Learning Based Rolling Bearing Faults Diagnosis with Curvelet Transform</b></p>

	<p><b>Authors:</b> Ziming Lu, Jiang-Wen Xiao and Zhengyi Huang</p> <p><b>Abstract:</b> Rolling bearing faults are among the primary causes of breakdown in mechanical equipment. Aiming at the vibration signals of rolling bearing which are non-stationary and easy to be disturbed by noise, a novel fault diagnosis method based on curvelet transform and metric learning is proposed. This method consists of 3 parts. The first one is feature engineering which includes reshaping the original timing features of rolling bearings, employing curvelet transform to transform reshaped features and making its coefficients as the new features. Curvelet transform can analyse the original signal from many angles. The second one is employing metric learning to map these new features into special embedding space. The last one is applying KNN classifier to detect the rolling bearing faults. Metric learning can effectively improve the performance of KNN by learning a mapping matrix to modify the distribution of samples. The proposed method overcomes the problems such as the subjectivity and blindness of manual feature extraction, poor coupling in each stage and sensitive to the effect of noise. Extensive simulations based on several data-sets show that the our method has better performance on bearing fault diagnosis than traditional methods.</p>
<p><b>P1018</b></p>	<p><b>Title: Video Object Detection by aggregating features across adjacent frames</b></p> <p><b>Authors:</b> Ruyi Zhang, Zhenjiang Miao, Qiang Zhang, Shanshan Hao, Shengbo Wang</p> <p><b>Abstract:</b> Video object detection is of great significance for video analysis. In contrast to object detection in still image, video object detection is more challenging which suffers from motion blur, varying view-points/pose, and occlusion. Existing methods utilized temporal information during detection in videos and show improvement over static-image detector. In this paper, we propose a novel method for video object detection that can aggregate features across adjacent frames adaptively as well as capture more global cues so as to be more robust to drastic appearance changes. Initially, current frame feature and warped feature from adjacent frames can be obtained via feature extraction network and optical flow network. Next, a coherence contribution module is designed for adaptively feature aggregation of the two kinds of features obtained from the first step. Finally, the still-image detector which included an extra instance-level module that aggregates features from adjacent frames for capturing more global feature is adopted to get the final result. The experimental results evaluated on our method shows leading performance on the ImageNet VID dataset.</p>
<p><b>P1019</b></p>	<p><b>Title: Light Corner Based Object Detector with Stacked-ENet Backbones</b></p>

	<p><b>Authors:</b> Qingyu Li and Zhenjiang Miao</p> <p><b>Abstract:</b> Object detection algorithms have made great progress in the past few years because of the development of deep learning. From region selection to anchor box regression, the accuracy of the algorithms becoming more and more accurate, but they're also far away from vision mechanism of human. Corner based is a new approach for object detection, but methods proposed nowadays are in huge wastage of time and resource, leading them not available in vast bulk of jobs. In this paper, we proposed a method which makes corner-based object detector could inference in real-time. We analyze the disadvantages of existing methods, found out the most consuming parts and the solution for improvements, which finally makes the algorithm efficiency and get a result which is competitive with other existing real-time methods.</p>
<p><b>P1020</b></p>	<p><b>Title: Iterative Relation Reasoning for Multiple Object Recognition</b></p> <p><b>Authors:</b> Tianyu Zhou and Zhenjiang Miao</p> <p><b>Abstract:</b> We present a novel model for multiple object recognition. Our model combines current deep learning recognition systems with object category relation information. This model is mainly inspired by spatial memory network [1], which treats multiple object recognition task as an iterative process, reusing some region feature as context information. We extend this work by presenting a statistical-based category relation model to measure object category semantic relevance. With the spatial memory and category relation model as relation reasoning modules, our model takes in context information. Our model achieves 4.4% per-instance and 4.9% per-class absolute improvement of average classification accuracy over plain convolutional neural networks on ADE dataset.</p>
<p><b>P1024</b></p>	<p><b>Title: Atrial fibrillation detection based on EEMD and XGBoost</b></p> <p><b>Authors:</b> Zhang Yue and Zhu Jinjing</p> <p><b>Abstract:</b> The electrocardiogram (ECG) is non-invasive, inexpensive and widely used in several applications, implemented to detect the physical condition and disease of the human body. Atrial fibrillation (AF) is the most common of many different forms of sustained arrhythmia. Therefore, early diagnosis of AF may help to improve doctor's diagnostic efficiency and is essential to prevent further progression of Atrial fibrillation to other heart disease and stroke complications. With the popularity of the machine learning and deep learning, more and more researchers apply them in image recognition, speech recognition and so on. Naturally, there are also many studies which achieve the purpose of diagnosing diseases, such as detection of arrhythmia, biometric identification based on ECG</p>

	<p>signals and machine learning or deep learning. A novel approach to detect AF from ECG signals was developed on this study, we used great filter EEMD (Ensemble Empirical Mode Decomposition) and classifier XGBoost (eXtreme Gradient Boosting) to detect normal rhythm, AF and other rhythm. Finally, the great performance was achieved with an average F1 score of 0.84 and accuracy of 0.86.</p>
<b>P1025</b>	<p><b>Title: Detection and implementation of driver's seatbelt based on FPGA</b></p> <p><b>Authors:</b> Wu Tianshu, Zhang Zhijia, Liu Zhanning, Liu Yunpeng and Wang Shixian</p> <p><b>Abstract:</b> In this paper, the driver's seatbelt detection algorithm is transplanted to the PYNQ embedded platform of XILINX to meet the technical requirements of automatic identification and detection of whether the driver wears a seatbelt or not. In this paper, aiming at the characteristics of the hardware of the FPGA, the driver's seatbelt detection algorithm is realized by IP core from XILINX open source. Vehicle detection is realized by using YOLO object detection algorithm with 3 bit weight and 1 bit activation, and driver's seatbelt classification is realized by using binary model with 1 bit weight and 1 bit activation. On the PYNQ embedded hardware of XILINX, the acceleration of the algorithm is realized by calling the hardware of FPGA on the ARM side.</p>
<b>P2002</b>	<p><b>Title: Gated Time Delay Neural Network for Speech Recognition</b></p> <p><b>Authors:</b> Kaibin Chen, Weibin Zhang, Dongpeng Chen, Xiaorong Huang, Boji Liu and Xiangmin Xu</p> <p><b>Abstract:</b> In deep neural networks, the gate mechanism is a very effective tool for controlling the information flow. For example, the gates of Long Short-Term Memory (LSTM) help alleviate the gradient vanishing problem. In addition, these gates preserve useful information. We believe that it will benefit if the system learns to explicitly focus on the relevant dimensions of the input. In this paper, we propose Gated Time Delay Neural Networks (Gated TDNN) for speech recognition. Time-delay layers are utilized to model the long temporal context correlation of speech signal while the gate mechanism enables the model to discover the relevant dimensions of the input. Our experimental results on the Switchboard and the Librispeech data sets demonstrate the effectiveness of the proposed method.</p>
<b>P2003</b>	<p><b>Title: Time Delay Recurrent Neural Network For Speech Recognition</b></p>

	<p><b>Authors:</b> Boji Liu, Weibin Zhang, Xiangming Xu and Dongpeng Chen</p> <p><b>Abstract:</b> In Automatic Speech Recognition(ASR), Time Delay Neural Network (TDNN) has been proven to be an efficient network structure for its strong ability in context modeling. In addition, as a feed-forward neural architecture, it is faster to train TDNN, compared with recurrent neural networks such as Long Short-Term Memory (LSTM). However, different from recurrent neural networks, the context in TDNN is carefully designed and is limited. Although stacking Long Short-Term Memory (LSTM) together with TDNN in order to extend the context information have been proven to be useful, it is too complex and is hard to train. In this paper, we focus on directly extending the context modeling capability of TDNNs by adding recurrent connections. Several new network architectures were investigated. The results on the Switchboard show that the best model significantly outperforms the base line TDNN system and is comparable with TDNN-LSTM architecture. In addition, the training process is much simpler than that of TDNN-LSTM.</p>
<p><b>P2005</b></p>	<p><b>Title:</b> A Comparison of Features for Replay Attack Detection</p> <p><b>Authors:</b> Zhifeng Xie, Weibin Zhang, Zhuxin Chen and Xiangmin Xu</p> <p><b>Abstract:</b> Speaker verification (ASV) systems are still vulnerable to different kinds of spoofing attacks, especially replay attack due to high-quality playback devices. Many countermeasures have been developed recently. Most of the efforts focus on the search for more salient features and many new features have been proposed. Five kinds of features, namely Mel-frequency cepstral coefficients (MFCCs), linear frequency cepstral coefficients (LFCCs), inverted Mel-frequency cepstral coefficients (IMFCCs), constant Q cepstral coefficients (CQCCs) and bottleneck features were compared on the public ASVspoof 2017 and BTAS 2016 datasets in this paper. Our experimental results show that MFCCs and bottleneck features yield comparable results. Both of them significantly outperform others (including the recently proposed CQCCs). However, the number of filters and cepstral bins are essential to the success of MFCCs.</p>
<p><b>18:00-19:00</b></p>	<p><b>Dinner</b> </p>

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## **NOTE**

