

# **Technique Program Guide**

## **2017 IEEE International Conference on Progress in Informatics and Computing**

### **Organizers:**

**Nanjing University of Science and Technology**

**Shanghai University of Finance and Economics**

### **Sponsors:**

**IEEE Beijing Section,**

**CCF YOCSEF-Nanjing**

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### Welcome from the General and Steering Committee Chairs



Kang Zhang



Mengqi Zhou



Yingling Wang



Hamido Fujita

It is our great pleasure to welcome you to the IEEE International Conference on Progress in Informatics and Computing, in short form, PIC2017. As the fifth edition of IEEE PIC conference series, this year's PIC 2017 will take place in Nanjing, China, December 15-17. This is the second time after PIC was held in Nanjing in 2015. All the other three conferences, PIC2010, PIC2014, and PIC2016 were held in Shanghai. Since 2010, PIC has been dedicated to address various issues of informatics and computing science, including artificial intelligence, multi-media and human-computer interaction, data management and software engineering, pervasive computing, and applied informatics.

It's been 67 years since Alan M. Turing proposed Turing test in 1950 to determine whether a computer can think. From then on, we have experienced the progress from computers that can only calculate simple arithmetic problems, to programs that can drive a car like human beings. Nowadays the progress is unceasingly speeding up. Big data and artificial intelligence technology are going deep into all aspects of our life, production, and management. In some cases, intelligent investment robots, robot doctors and industrial robots show their ability to outperform humans to a certain extent. Obviously, the technical advances will generate many societal gains, such as economic growth, higher living standards, longer life spans and less disease. There is no doubt that the upsurge of the researches in this area brings chances and challenges to us.

PIC 2017 conference aims at serving as a forum for researchers and scientists from areas of computing and informatics to present, discuss, and exchange ideas on enabling technologies, system designs, applications and practice experiences. We hope via this forum attendees can communicate with each other and reach a better understanding of different approaches as well as of their similarities. It is expected that the discussion will help inspire new ideas and potential collaboration between researchers during and after the conference. PIC 2017 is sponsored by IEEE Beijing Section, and co-organized by the Nanjing University of Science and Technology and the Shanghai University of Finance and Economics. The strong support from those affiliations are very important to the success of this year's conference. At this special moment, we would like to thank all the people involved in the organization of this conference. First of all, we thank all the authors who contribute their papers to the conference. Their excellent contribution lay the foundation for the success of this conference. We are grateful to all Program Committee members and numerous reviewers for their professional work on reviewing the papers. We wish to thank Program Committee Chairs for their hard work in preparing the conference. We also would like to express our sincere gratitude to all the Steering Committee members for their strong support to the conference, and the Publicity Chairs for their hard work in disseminating the CFP information to the relevant audiences. We also thank the Finance Chair, the webmaster and many volunteers for their hard work.

We are pleased that this year's PIC conference is held in Nanjing again. As a vigorous international

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metropolis, and the economic and cultural center in Yangzi River Delta Area, Nanjing welcomes visitors from all over the world. Its rich heritage of ancient Chinese culture and charming places are always irresistibly loved by tourists. In addition to the participation of this conference, we wish you will enjoy the charm of the city.

We believe the conference program and the beautiful city of Nanjing will leave you a lasting memory. We hope that PIC 2017 will be a productive meeting where you can gain a lot technically and socially with other researchers and friends from all over the world.

Welcome to PIC 2017, and enjoy the program!

**December 3, 2017**

**Hamido Fujita**

Iwate Prefectural University, Japan

**Yinglin Wang**

Shanghai University of Finance and Economics, China

**Kang Zhang**

University of Texas at Dallas, USA

**Mengqi Zhou**

IEEE Beijing Section, China

## **Welcome from the Program Committee Chairs**



### **Welcome from the Program Committee Chairs**

Welcome to Nanjing City and to the International Conference on Progress in Informatics and Computing (PIC 2017)! Welcome to Nanjing University of Science and Technology!

The purpose of PIC conference is to bring together developers and researchers to share ideas and research work in the emerging areas of informatics and advanced computational intelligence. It is a major event for researchers and practitioners in academia and industry to discuss the progress, challenges, experiences and trends on the theories and methodologies as well as the emerging applications of artificial intelligence and data science.

This year we received a large number of submissions (201) from 10 countries and regions. Each paper was reviewed by at least two referees and the authors were asked to address each comment made by the reviewers for improving the quality of their papers. Decisions have been taken based on the originality and innovation of each submission. This resulted in that 91 papers were selected in the proceeding using the following areas: artificial intelligence, multi-media & human-computer interaction, databases and information systems, software engineering, pervasive computing and applied informatics. The acceptance rate for the proceeding papers is about 45.5 %. In addition, we selected about 10 papers from the submissions to be published in the Journal of Shanghai Jiao Tong University. The acceptance rate for papers to be published in the journal is about 5%. All the accepted papers will be presented or posted at the conference.

This volume of the proceedings contains the abstracts of 4 keynote speeches, 91 papers selected for presentation and poster at the conference. The papers were categorized into five categories: artificial intelligence; multimedia and human-computer interaction; data management and software engineering; pervasive computing; and applied informatics.

PIC 2017 consists of a three-day conference which includes 8 oral sessions, 3 poster sessions of papers, 1 demo track, 4 keynote talks and 2 workshops. The four keynote speeches will be given by Prof. Enrique Herrera-Viedma from University of Granada, Spain; Prof. James E. Fowler (IEEE Fellow) from Mississippi State University, USA; A/professor Yanghua Xiao, from Fudan University, China; Professor Kaiming Li, from Sichuan University, China. The topics of the four speeches include intelligent decision making, knowledge graphs, and image analysis. The varieties of the topics will benefit attendees from different sub-fields. Moreover, the commonalities imbedded in those topics are the basis for communications among the audience.

Besides the main conference, this year we organize two special workshops on the field of hyper-spectral and medical image analysis, in which we invite 10 experts of this field to deliver talks and share their experiences. Prof. Jun Li, Sun Yat-sen University, China; Dr. Wenzhi Liao, Ghent University, Belgium; Prof. Wei Li, Beijing University of Chemical Technology; Prof. Yongqiang Zhao, Northwestern

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Polytechnical University; Prof. Sen Jia, Shenzhen University; Prof. Xiaoyan Ke, Nanjing Brain Hospital; Prof. Dengwang Li, Shandong Normal University; Associate Prof. Xi Jiang, University of Electronic Science & Technology of China; Associate Prof., Yi Wu, third Military Medical University; Dr. Jia-Sheng Rao, Beihang University. It offers a rare opportunity for people to communicate in this particular field.

With so many technical activities, we believe PIC 2017 will be an academic feast. With the active participation of all of you, we can expect that you will benefit a lot from the conference.

An international conference of this size requires the support and help of many people. A lot of people have worked hard to produce a successful PIC 2017 technical program and conference proceedings. Firstly I would like to give my special thanks to Prof. Hamido Fujita, Chair of the Steering Committee, for his strong encouragement, guidance, and insights. Many thanks to Prof. Yinglin Wang, Prof. Mengqi Zhou, Prof. Kang Zhang, chairs of general conference, for their effectively coordinating the conference and shaping the program. And I would like to express many thanks to all the workshop chairs and committee members.

I express my appreciation to Dr. Zhichao Lian for his efficient work in dealing with conference matters.

We would like to take this opportunity to thank all the authors who submitted their papers to PIC2017, organizers, program committee members, reviewers and volunteers that made it possible to arrange a truly outstanding program. We also want to express our gratitude to the invited speakers for sharing their exciting works and experiences.

In addition, we would like to express our special thanks to the EasyChair System, all the sponsors of the conference, the National Science Foundation of China (No. 61571230, 11431015, 61375053) and the IEEE Beijing Section for their support to the proceedings of PIC 2017.

Finally we do hope that you will enjoy the quality of the PIC 2017 and your time in the beautiful city of Nanjing.

**December 3, 2017**

**Liang Xiao**

Nanjing University of Science and Technology, China

## PIC Program at a Glance

<b>Time</b>		<b>venue</b>	<b>Activity</b>
<b>Dec.15</b>	<b>8:00-22:00</b>	<b>Qinglv Hotel</b>	<b>Registration</b>
<b>Dec.16</b>	<b>8:30-17:35</b>	<b>Report Room</b>	<b>Registration</b>
<b>Dec.17</b>	<b>9:00-15:00</b>	<b>Report Room</b>	<b>Registration</b>
<b>Dec.16</b>	<b>8:30-12:30</b>	<b>Report Room</b>	<b>Opening &amp; Keynote Speech</b>
<b>Dec.16</b>	<b>14:00-17:35</b>	<b>Report Room</b>	<b>Workshop and Poster Session</b>
<b>Dec.16</b>	<b>14:00-16:50</b>	<b>Meeting Room-704</b>	<b>Oral Sessions</b>
<b>Dec.16</b>	<b>14:00-16:50</b>	<b>Meeting Room-709</b>	<b>Oral Sessions</b>
<b>Dec.16</b>	<b>18:00-21:00</b>	<b>Zilu Hotel</b>	<b>Banquet</b>
<b>Dec.17</b>	<b>9:00-12:35</b>	<b>Report Room</b>	<b>Workshop and Poster Session</b>
<b>Dec.17</b>	<b>9:00-12:20</b>	<b>Meeting Room-704</b>	<b>Oral Sessions</b>
<b>Dec.17</b>	<b>9:00-12:05</b>	<b>Meeting Room-709</b>	<b>Oral Sessions</b>
<b>Dec.17</b>	<b>14:00-15:00</b>	<b>Report Room</b>	<b>Poster Session</b>
<b>Dec.17</b>	<b>14:00-15:00</b>	<b>Meeting Room-704</b>	<b>Demo Session</b>



# PIC-2017 Program Details

## 会议日程

- The venue for conference is **the report room of the first floor of the new library building**. 主会议室地点在新图书馆一楼报告厅。
- The venue for poster & Tea Break is **the corridor of the first floor of the new library building**. Poster 与茶歇地点在新图书馆一楼报告厅走廊。
- The venue for oral is **the meeting room-704 and room-709 of the new library building**. Oral 地点在新图书馆 7 楼 704 与 709 会议室。

**16th, Dec. 2017**

Time	Activity
<b>8:30-9:00</b>	Opening ceremony. Welcome from Chairs: Hamido Fujita, Prof. Iwate Prefectural University, Iwate, Japan. (Editor-in-Chief Knowledge based Systems)
<b>9:00-9:50</b>	Invited Speaker: James E. Fowler, IEEE Fellow, Mississippi State University, USA. (Editor-in-Chief, IEEE Signal Processing Letter) Invited Talk: <b>Reconstruction and Analysis of Hyperspectral Imagery Using Random Projections</b>
<b>9:50-10:40</b>	Invited Speaker: Enrique Herrera-Viedma, Prof., University of Granada, SPAIN. (Associate Editor, IEEE TRANSACTIONS ON SYSTEMS, MAN, AND CYBERNETICS) Invited Talk: <b>Intelligent decision making and Consensus</b>
<b>10:40-11:00</b>	Tea Break
<b>11:00-11:45</b>	Invited Speaker: Kaiming Li ,Prof., Sichuan University, China Invited Talk: <b>Towards individualized MRI brain imaging analysis</b>
<b>11:45-12:30</b>	Invited Speaker: Yanghua Xiao, Assoc. Prof., Fudan University, China Invited Talk: <b>Language Understanding with Knowledge Graph</b>
<b>12:30-14:00</b>	Lunch
<b>14:00-17:35</b>	<b>Workshop on Hyperspectral Image Analysis and Applications</b>
<b>14:00-14:35</b>	Workshop Invited Speaker: Jun Li, Prof., Sun Yat-sen University, China (Associate Editor, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing) Invited Talk: <b>Remote Sensing and Social Media</b>
<b>14:35-15:10</b>	Workshop Invited Speaker: Wenzhi Liao, Prof., Ghent University, Belgium (Associate Editor , IET Image Processing) Invited Talk: <b>Hyperspectral image for precision agriculture: applications to disease detection and fruit sorting</b>

<b>15:10-15:50</b>	<b>Poster session 1 and Tea Break:</b>
	<b>PIC-5</b> Gravitational Search Algorithm Combined with Modified Differential Evolution Learning for Planarization in Graph Drawing
	<b>PIC-8</b> A Preference-based Multi-objective Evolutionary Strategy for Ab Initio Prediction of Proteins
	<b>PIC-11</b> Rainbow k-connectivity of some Cartesian product graphs
	<b>PIC-15</b> A new surrogate for tensor multirank and applications in image and video completion
	<b>PIC-23</b> Metrics Analysis Based on Call Graph of Class Methods
	<b>PIC-30</b> A Parameterized Flattening Control Flow Based Obfuscation Algorithm with Opaque Predicate for Reduplicate Obfuscation
	<b>PIC-43</b> Leveraging Morphological Information via Employing Word Hashing for Sequence Labeling
	<b>PIC-46</b> Improved Reversible Information Hiding with Adaptive Prediction
	<b>PIC-60</b> Intermittent Control with Reinforcement Learning
	<b>PIC-62</b> Joint Power and Timeslot Allocation Based on Delay Priority for Multi-Beam Satellite Downlinks
	<b>PIC-71</b> Study on smart care service for the aged based on context awareness
	<b>PIC-85</b> Noise Reduction and Analysis for Chang'E-1 Imaging Interferometer(IIM) Data
	<b>PIC-94</b> The Study of Image Feature Extraction and Classification
	<b>PIC-95</b> The Realization of Identification Method for DataMatrix Code
	<b>PIC-107</b> A Research on Adaptive Calibration Algorithm for Multi- Geometric Projection
	<b>PIC-109</b> A Short - Term Marginal Price Forecasting Model Based on Ensemble Learning
	<b>PIC-111</b> Trust Your Wallet: a New Online Wallet Architecture for Bitcoin
	<b>PIC-117</b> ACER: An Adaptive Context-Aware Ensemble Regression Model for Airfare Price Prediction
	<b>PIC-118</b> Underfloor Heating Users Prediction Based on SVDD
	<b>PIC-127</b> An Importance-Based Approach for Mining Approximate Roles
	<b>PIC-134</b> Evaluation Method and Decision Support of Network Education Based on Association Rules
	<b>PIC-149</b> Scalable stream Bayes classification based on Dirichlet prior
<b>15:50-16:25</b>	Workshop Invited Speaker: Wei Li , Prof., Beijing University of Chemical Technology, China Invited Talk: <b>Deep Convolutional Neural Networks for Hyperspectral Image Classification</b>
<b>16:25-17:00</b>	Workshop Invited Speaker: Yongqiang Zhao, Prof., Northwestern Polytechnical University, China Invited Talk: <b>Hyperspectral Imagery Restoration: in Low Rank Perspective</b>

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<b>17:00-17:35</b>	Workshop Invited Speaker: Sen Jia, Prof., Shenzhen University, China Invited Talk: <b>Density Clustering and Super pixel Guided Approaches for Hyperspectral Image Processing</b>
<b>14:00-15:15</b> <b><u>In Room-704</u></b>	<b>Oral session 1A: Computer Vision I</b> <b>Format (12 min. for presentation + 3 min. for question.)</b> <b>14:00-14:15</b> <i>PIC-53</i> Haijiao Liu and Jun Zhang, Filtering Combined Dynamic Stochastic Resonance for Enhancement of Dark and Low-contrast Images <b>14:15-14:30</b> <i>PIC-75</i> Xiaoyan Qian,Lei Han,Yanlin Zhang,Meng Ding, An object tracking method using deep learning and adaptive particle filter for night fusion image <b>14:30-14:45</b> <i>PIC-90</i> Yunfei Wang, Hui Ding, Yuanyuan Shang, Zhuhong Shao, Xiaoyan Fu, An Improved Anchored Neighborhood Regression Enhancement for Face Recognition <b>14:45-15:00</b> <i>PIC-103</i> Jin hua Zeng, Jinfeng Zeng, Xiulian Qiu Deep learning based forensic face verification in videos <b>15:00-15:15</b> <i>PIC-121</i> Shuyin Tao, Wende Dong, Zhenmin Tang, Qiong Wang, Blind Image Deconvolution Using the Gaussian Scale Mixture Fields of Experts Prior <b>15:15-15:50</b> Tea Break
<b>15:50-16:50</b> <b><u>In Room-704</u></b>	<b>Oral session 1B: Artificial Intelligence I</b> <b>Format (12 min. for presentation + 3 min. for question.)</b> <b>15:50-16:05</b> <i>PIC-50</i> Guoqing Xia, Yao Shen, Qiang Lin, Lexicon-Based Semi-CRF for Chinese Clinical Text Word Segmentation <b>16:05-16:20</b> <i>PIC-58</i> Areerat Trongratsameethong Join Order Algorithm Using Predefined Optimal Join Order <b>16:20-16:35</b> <i>PIC-97</i> Hanxiao Shi, Yahui Zhang, Yi Zou, Xiaojun Li, Fine-grained Sentiment Analysis of Reviews Using Shallow Semantic Information <b>16:35-16:50</b> <i>PIC-98</i> Hengxun Li,Ning Wang,Guangjun Hu,Weiqing Yang, PGM-WV: a context-aware hybrid model for heuristic and semantic question classification in question-answering system
<b>14:00-15:15</b> <b><u>In Room-709</u></b>	<b>Oral session 2A: Artificial Intelligence II</b> <b>Format (12 min. for presentation + 3 min. for question.)</b> <b>14:00-14:15</b> <i>PIC-45</i> Xuesi Li, Kai Jiang, Hongbo Wang, Xuejun Zhu, Ruochong Shi,Haobin Shi, A Novel K-Means Classification Method with Genetic Algorithm <b>14:15-14:30</b> <i>PIC-72</i> Hang Yu,Xiaoxiao Qian, Yang Yu,Jiujun Cheng,Ying Yu, Shangce Gao, A Novel Mutual Information based Ant Colony Classifier

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	<b>14:30-14:45</b> <i><b>PIC-84</b></i> Yanghao Zhang,Shaoning Zeng,Wei Zeng,Jianping Gou, GNN-CRC: Discriminative Collaborative Representation based Classification via Gabor Wavelet Transformation and NN
	<b>14:45-15:00</b> <i><b>PIC-119</b></i> Qin Zhang, Jianhua Liu, Ying Wang, Zhixiong Zhang, A Convolutional Neural Network Method for Relation Classification
	<b>15:00-15:15</b> <i><b>PIC-131</b></i> Ganyi Tang,Guifu Lu, Block PCA with Lp-norm for Robust and Sparse Modelling
	<b>15:15-15:50</b> Tea Break
<b>15:50-16:50</b> <b><u>In Room-709</u></b>	<b>Oral session 2B: Artificial Intelligence II</b> <b>Format (12 min. for presentation + 3 min. for question.)</b>
	<b>15:50-16:05</b> <i><b>PIC-24</b></i> Liqian Wang, Wenze Shao, Qi Ge, and Haibo Li, Liang Xiao, Zhihui Wei, Video Enhancement Using Temporal-Spatial Total Variation Retinex and Luminance Adaptation
	<b>16:05-16:20</b> <i><b>PIC-52</b></i> Peipei Sun and Hongyi Liu, Hyperspectral Image Low-rank Restoration Based Spectral-spatial Total Variation
	<b>16:20-16:35</b> <i><b>PIC-83</b></i> Yong Wei, Bin Xu, Mengyi Ying, Junfeng Qu, Ryan Duke, Two Dimensional Paraspinal Muscle Segmentation in CT Images
	<b>16:35-16:50</b> <i><b>PIC-120</b></i> Shuyin Tao, Wende Dong, Zhenmin Tang, Qiong Wang, Fast Non-blind Deconvolution Method for Blurred Image Corrupted by Poisson Noise
<b>18:00- 21:00</b>	Banquet.

17th, Dec. 2017

Time	Activity
<b>9:00-12:35</b>	<b>Workshop on Medical Image Processing and Analysis</b>
<b>9:00-9:35</b>	Workshop Invited Speaker: Xiaoyan Ke, Prof., Nanjing Medical University, China Invited Talk: <b>Neuroimaging Studies of Chinese Children with Autism</b>
<b>9:35-10:10</b>	Workshop Invited Speaker: Xi Jiang ,Prof., University of Electronic Sci. & Tech. of China Invited Talk: <b>Machine Learning in Functional Brain Imaging Analysis</b>
<b>10:10-10:50</b>	<b>Poster session 2 and Tea Break:</b> <b>PIC-6</b> A Comparison Study of Outpatient Visits Forecasting Effect between ARIMA with Seasonal Index and SARIMA <b>PIC-14</b> An Improved Constraint Model for Team Tactical Position Selection in Games <b>PIC-28</b> Playing Games with Reinforcement Learning via Perceiving Orientation and Exploring Diversity <b>PIC-49</b> A New Fusion Chemical Reaction Optimization Algorithm based on Random Molecules for Multi-Rotor UAV Path Planning in Transmission Line Inspection <b>PIC-51</b> Hybrid Features for Short Texts Matching, from Sentence-level and Shallow-level Perspectives <b>PIC-63</b> Model-based DDPG for motor control <b>PIC-74</b> A Chinese Question Answering System in Medical Domain <b>PIC-88</b> Kernelized convex hull for visual tracking <b>PIC-91</b> Coupled Autoencoders Learning for Zero-shot Classification with Domain Shift <b>PIC-99</b> The Application of Natural Language Processing in Compiler Principle System <b>PIC-101</b> Parallelizing Convolutional Neural Network for the Handwriting Recognition Problems with Different Architectures <b>PIC-106</b> Polarization and Solar Altitude Correlation Analysis and Application in Object Detection <b>PIC-110</b> An English Subordinate Clause Connective Correction Model Based on Genetic Algorithm and K-Nearest Neighbor Algorithm <b>PIC-112</b> English Mispronunciation Detection Based on Improved GOP Methods for Chinese Students <b>PIC-115</b> A Discourse Coherence Model for Analyzing Chinese Students' Essay <b>PIC-130</b> Single Image Super-Resolution Reconstruction via Combination Mapping with Sparse Coding <b>PIC-136</b> Evaluation and Analysis of Network Coding at Network Layer <b>PIC-138</b> A Privacy-Preserving Data Sharing Solution for Mobile Healthcare

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	<p><b>PIC-143</b> Sequence-based Protein-Ca<sup>2+</sup> Binding Site Prediction Using SVM Classifier Ensemble with Random Under-Sampling</p> <p><b>PIC-146</b> Research on the Complexity of Technological Innovation Supported by Internet</p> <p><b>PIC-150</b> Multimodal deep learning network based hand ADLs tasks classification for prosthetics control</p> <p><b>PIC-152</b> Design of Low Cost Pedestrian Location System Based on Inertial Navigation</p> <p><b>PIC-156</b> Fine-Grained Opinion Extraction from Chinese Car Reviews with An Integrated Strategy</p>
<b>10:50-11:25</b>	<p>Workshop Invited Speaker: Dengwang Li, Prof., Shandong Normal University, China</p> <p>Invited Talk: <b>Cumulative dose of radiation therapy of hepatocellular carcinoma patients and its deterministic relation to radiation-induced liver disease</b></p>
<b>11:25-12:00</b>	<p>Workshop Invited Speaker: Yi Wu, Prof., Third Military Medical University, China</p> <p>Invited Talk: <b>Application of Digital Medicine in Oncology</b></p>
<b>12:00-12:35</b>	<p>Workshop Invited Speaker: Jia-Sheng Rao, Prof., Beihang University, China</p> <p>Invited Talk: <b>Functional connectivity analysis in spinal cord injured Rhesus monkeys</b></p>
<b>9:00-10:00</b> <b><u>In Room-704</u></b>	<p><b>Oral Session 3A: Pervasive Computing</b> <b><u>Format (12 min. for presentation + 3 min. for question.)</u></b></p> <p><b>9:00-9:15</b> <b>PIC-27</b> Shanshan Xiang, Yaojie Chen, Task Assignment Modeling and Simulation for Cooperative Driving of Multiple Vessels</p> <p><b>9:15-9:30</b> <b>PIC-122</b> Yufei Wang, Guangtao Xue, Shiyu Qian, Minglu Li, An Online Cost-Efficient Scheduler for Requests with Deadline Constraint in Hybrid Clouds</p> <p><b>9:30-9:45</b> <b>PIC-139</b> Chanying Huang, Kedong Yan, Songjie Wei, Gongxuan Zhang, Dong Hoon Lee, Efficient Anonymous Attribute-Based Encryption with Access Policy Hidden for Cloud Computing</p> <p><b>9:45-10:00</b> <b>PIC-142</b> Xiao-xuan Ma, Xiu-xia Zhang, Li-Xin Guo, Zhen-wei Ding, Li-long Zhang, Shu-yi Wei, An Intelligent Old-age Home Endowment Monitoring System Based on Internet of Things</p> <p><b>10:00-10:50</b> Tea Break</p>
<b>10:50-12:20</b> <b><u>In Room-704</u></b>	<p><b>Oral Session 3B: Applied Informatics</b> <b><u>Format (12 min. for presentation + 3 min. for question.)</u></b></p> <p><b>10:50-11:05</b> <b>PIC-36</b> Dongbao Jia, Yuta Takashima, Masaya Hasegawa, Shigeki Hirobayashi, and Tadanobu Misawa, Application to SSVEP of Chirp Stimulus Using Non-Harmonic Analysis</p>

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	<b>11:05-11:20</b> <i><b>PIC-79</b></i> Yi Zhao, Kun Zhang and Hong Zhang,Xia Yan and Ying Cai, Hot Topic Detection Based on Combined Content and Time Similarity
	<b>11:20-11:35</b> <i><b>PIC-124</b></i> Shuang Li, Shizune Takahashi, Keizo Yamada, Masanori Takagi and Jun Sasaki, Analysis of SNS Photo Data Taken by Foreign Tourists to Japan and a Proposed Adaptive Tourism Recommendation System
	<b>11:35-11:50</b> <i><b>PIC-128</b></i> Shangchi Lin, Bowen Liu, Yang Wen, Anum Masood, Bin Sheng, Ping Li, Xin Liu, Haoyang Yu, Weiyao Lin, Efficient Pose Machine Based on Parameter-Sensitive Hashing
	<b>11:50-12:05</b> <i><b>PIC-148</b></i> Xiangqun Song, Qianli Ma, Wenyuan Wang, Yun Peng, Capacities-based distant-water fishery cold chain network design considering yield uncertainty and demand dynamics
	<b>12:05-12:20</b> <i><b>PIC-155</b></i> Jianzhang Zhang, Yinglin Wang, Wentao Wang and Nan Niu, A Rule-based Method for Detecting the Missing Common Requirements in Software Product Line
<b>9:00-10:00</b> <b><u>In Room-709</u></b>	<b>Oral session 4A: Database and Information System</b> <b><u>Format (12 min. for presentation + 3 min. for question.)</u></b>
	<b>9:00-9:15</b> <i><b>PIC-21</b></i> Junxian Li, Wei Wang, Querying Linked Data Based on Hierarchical Multi-hop Ranking Model
	<b>9:15-9:30</b> <i><b>PIC-29</b></i> Zhao Gang, Di Bingbing, Zhu Wenjuan, Li Yaxu, He Hui,Zan Hui, Design and Implementation for Tujia Brocade Cultural Coordinate Panorama Display System Based on Touch Screen
	<b>9:30-9:45</b> <i><b>PIC-92</b></i> Jiajun Xu, Lin Guo, Ruxia Zhang, Yin Zhang, Hualang Hu, Fei Wang, and Zhiyuan Pei, Towards Fuzzy QoS Driven Service Selection with User Requirements
	<b>9:45-10:00</b> <i><b>PIC-114</b></i> Yu Liu, Haopeng Chen,Fei Hu, A Blockchain-based Verification for Sharing Data Securely
	<b>10:00-10:50</b> Tea Break
<b>10:50-12:05</b> <b><u>In Room-709</u></b>	<b>Oral session 4B: Optimization and Scheduling</b> <b><u>Format (12 min. for presentation + 3 min. for question.)</u></b>
	<b>10:50-11:05</b> <i><b>PIC-76</b></i> Yang Yu,Lei Wu, Hang Yu, Sheng Li, Shi Wang,Shangce Gao, Brain Storm Optimization with Adaptive Search Radius for Optimization
	<b>11:05-11:20</b> <i><b>PIC-78</b></i> Wenyong Zhong, Yanxin Cao, Jiawen Li, Jianhua Sun, Hao Chen, Specialization or Generalization: A Study on Breadth-First Graph Traversal on GPUs
	<b>11:20-11:35</b> <i><b>PIC-87</b></i> Qing Yang, Zhong Yang, Guo-Xiong Hu, Wei Du, A Random Chemical Reaction Algorithm based on Double Containers for Robot Path Planning
	<b>11:35-11:50</b> <i><b>PIC-147</b></i> Jinbin Tu,Tianhao Yang,Yi Zhang,Jin Sun, Particle

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	Swarm Optimization Based Task Scheduling for Multi-core Systems Under Aging Effect
<b>11:50-12:05</b>	<b>PIC-153</b> Jin Sun,Yi Zhang, An Energy-Aware Mapping Algorithm for Mesh-based Network-on-Chip Architectures
<b>12:35-14:00</b>	Lunch
<b>14:00-15:00</b>	<b>Poster session 3:</b>
	<b>PIC-1</b> Current Progress in Discriminative Object Tracking
	<b>PIC-31</b> A Pan-sharpening Method for Multispectral Image with Back Propagation Neural Network and Its Parallel Optimization Based on Spark
	<b>PIC-33</b> Mineral Identification and Geological Mapping Using Near-Infrared Spectroscopy Analysis
	<b>PIC-37</b> Military Object Detection Using Multiple Information Extracted from Hyperspectral Imagery
	<b>PIC-44</b> An automatic pipeline of delineation and 3D profile mapping for potential exploration targets from mineral data of limited drilling cores
	<b>PIC-77</b> PMAC: Proxy Re-Encryption based Multi-factor Access Control for ciphertext in Cloud
	<b>PIC-86</b> Research on Abnormal Behavior Target Tracking Algorithm in Airport Intelligent Video Surveillance
	<b>PIC-89</b> 3D Model Reconstruction based on Plantar Image's Feature Segmentation
	<b>PIC-93</b> Visual Tracking via Sparse Coding and Spectral Residual
	<b>PIC-100</b> An approach based on decision tree for analysis of behavior with Combined Cycle Power Plant
	<b>PIC-126</b> Image Enhancement based on Adaptive Demarcation between Underexposure and Overexposure
	<b>PIC-129</b> Transferring Digit Classifier's Features to a Traffic Sign Detector
	<b>PIC-135</b> Maximizing Bichromatic Reverse k Nearest Neighbor with Multi-level Tags Queries in Spatial-textual Databases
	<b>PIC-137</b> Multiple Objects Tracking Based on Multiple Information Integration
	<b>PIC-144</b> Pseudo-Inverse Locality Preserving Iterative Hashing
	<b>PIC-145</b> Distribution Law of User Comments from Hot News
	<b>PIC-154</b> Infrared Remote Sensing Imaging via Asymmetric Compressed Sensing
	<b>PIC-157</b> Face Hallucination with Weighted Nuclear Norm Constraint
<b>14:00-15:00</b> <b><u>In Room-704</u></b>	<b>Demo session</b>
<b>15:00-15:30</b>	Closing



## Notes for Reporters

### Oral Reports

1. The reporters should send the slides to [picconf@yeah.net](mailto:picconf@yeah.net) before Dec.14;
2. The time for each report is 15 minutes, including 12 minutes for report, 3 minutes for Q&A;
3. Each session is equipped with computers and LCD projectors.

### Poster Reports

1. The authors are required to make the wall paper (with size height 120cm X width 90cm and in free format) by themselves;
2. The materials to post the wall paper will be provided on-site.
3. For the poster authors, please post your poster to the panel during coffee break.
4. When the poster session is finished, please remove the poster by yourselves.

### 口头论文报告方式

1. 报告者需将报告电子文件于 14 日之前发送至组委会邮箱 [picconf@yeah.net](mailto:picconf@yeah.net) ；
2. 每篇论文报告时间为 15 分钟，包括 12 分钟正式报告、3 分钟提问讨论；
3. 每场次均配置有计算机及 LCD 投影机。

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2. 张贴所需材料, 由现场提供;
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*IEEE PIC 2017 Keynote Speech (1)*

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**Reconstruction and Analysis of Hyperspectral Imagery Using Random Projections**

**James E. Fowler**

Professor, IEEE Fellow

Mississippi State University, USA

**Abstract:**

The ever-growing spatial and spectral resolution of hyperspectral imagery has increased interest in dimensionality reduction that takes place on-board the data-acquisition platform. However, traditional dimensionality-reduction algorithms are data dependent, computationally expensive, and, consequently, prohibitive for many resource-constrained airborne or satellite-borne sensor platforms. Random projections offer a means for accomplishing dimensionality reduction simultaneously with data acquisition, such that the sensor projects onto a lower-dimensional subspace chosen at random. The problem of reconstruction from random projections is addressed, considering both compressed sensing as well as an alternative based on principal components. The effect of random projections on the performance of hyperspectral analysis is also investigated, with particular focus on anomaly detection and classification. It is observed that strongly anomalous vectors are likely to be identifiable in the domain of the random projections even at low dimension, while widely separated classes are likely to remain so. Finally, the ability of applying such anomaly or class analysis in the random-projection domain is exploited to improve subsequent reconstruction of the hyperspectral dataset.



**Biography:** James E. Fowler is currently Billie J. Ball Professor and Graduate Program Director of the Department of Electrical and Computer Engineering at Mississippi State University, Starkville, MS. He is also an Associate Director of the Distributed Analytics and Security Institute (DASI) as well as a researcher in the Geosystems Research Institute (GRI), both at the Mississippi State HPC2. He has held visiting professor positions in the Département Traitement du Signal et des Images at Télécom ParisTech, Paris, France, and at Polytech Nantes, Nantes, France. He held a postdoctoral research position in the Laboratoire I3S at the Université de Nice—Sophia Antipolis, Sophia Antipolis, France. He is the Editor-in-Chief of IEEE Signal Processing Letters, and was previously a Senior Area Editor for IEEE Transactions on Image Processing and previously an Associate Editor for IEEE Transactions on Computational Imaging, IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, and IEEE Signal Processing Letters. He is an Associate Editor for the EURASIP Journal on Image and Video Processing. He is a member of the Publications Board and the Conference Board of the IEEE Signal Processing Society. He was the Chair of the Image, Video, and Multidimensional Signal Processing (IMVSP) Technical Committee of the IEEE Signal Processing Society for 2012–2013, having served as also as Vice Chair and Past Chair. He is currently a member of the Computational Imaging Special Interest Group of the IEEE Signal Processing Society. He was a member of the Strategic Planning Committee of the IEEE Publication

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Services and Products Board in 2013. He is a Fellow of the IEEE. He was general co-chair of the 2014 IEEE International Conference on Image Processing, Paris, France. He is a member of the program committee for the Data Compression Conference.

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*IEEE PIC 2017 Keynote Speech (2)*

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**Intelligent decision making and Consensus**

**Enrique Herrera-Viedma**

Professor of Department of Computer Science and Artificial Intelligence  
University of Granada  
SPAIN

**Abstract:**

Societal and technological trends make the decision environments more and more complex. The emergence of the intelligent decision making technology provides a good decision support to deal with these complex decision making problems, and Artificial Intelligence tools play a core role in the intelligent decision making technology. Nowadays we find many real world problems in which intelligent decision making processes are developed by automatic decision making systems that support individual or organizational decision making processes supported by different information technologies as the Web, Social Networks, Internet of the Things, Big Data, and Artificial Intelligence tools (as Computational Intelligence tools). In many cases, we find that the intelligent decision making processes involve the use of both preference modelling and consensus processes. The preference modelling deals with the representation and modelling of the preferences provided by the experts in the problems. The fuzzy logic is a computational intelligence tool that provides an adequate framework to deal with the uncertainty presented in the user opinions. The fuzzy preference modelling has been satisfactorily applied in intelligent decision making. On the other hand, consensus is an important area of research in intelligent decision making. Consensus is defined as a state of mutual agreement among members of a group where all opinions have been heard and addressed to the satisfaction of the group. A consensus reaching process is a dynamic and iterative process composed by several rounds where the experts express, discuss and modify their preferences. In this talk we show the main elements of the decision making activity in presence of vague information and uncertainty. In particular, we present different concepts to understand the research developed in the area of fuzzy decision making as fuzzy preference relations to represent expert preferences, aggregation operators, selection processes of alternatives, etc. We highlight the ongoing research on intelligent decision making, fuzzy preference modelling and consensus processes under uncertainty, focusing on how to solve consensus processes in intelligent decision making under fuzzy preference modelling. We show an overview of consensus models based on soft consensus measures, showing the pioneering and prominent papers, the main existing approaches and the new trends and challenges.



**Biography:** Prof. Dr. Enrique Herrera-Viedma received the M.Sc. and Ph.D. degrees in Computer Science from the University of Granada, Granada, Spain, in 1993 and 1996, respectively. He is currently a Professor of Computer Science with the Department of Computer Science and Artificial Intelligence, University of Granada, and also the new Vice-President for Research and Knowledge Transfer. His current research interests include

intelligent decision making, group decision making, consensus models, fuzzy linguistic modeling, aggregation of information, information retrieval, bibliometric, digital libraries, web quality evaluation, recommender systems, and social media. Around 29 of his papers are classed as highly cited in the Thomson Reuters database as well as being in the top 1% of the most cited papers in its field (Computer Science and Engineering). His h-index is 53 according to the Web of Science with more than 11.500 citations received and 73 according to Google Scholar with more than 21.000 citations received and he is ranked in the top 1% of the Most Cited Scientists in Engineering according to the Essential Science Indicators of Thomson. Dr. Herrera-Viedma is an Associate Editor of several core international journals indexed in Journal Citation Reports such as the IEEE TRANSACTIONS ON SYSTEMS, MAN, AND CYBERNETICS: SYSTEMS, Knowledge Based Systems, Soft Computing, Fuzzy Optimization and Decision Making, Applied Soft Computing, Journal of Intelligent and Fuzzy Systems, Information Fusion and Information Sciences; and a member of the editorial boards of other core international journals Fuzzy Sets and Systems, International Journal of Information Technology and Decision Making, and International Journal of Computational Intelligence. From 2014 he is member of the government of the IEEE SMC Society. He has recently published in the high relevant journal Science [339:6126, p. 1382, 2013] on the new role of the public libraries and he is a Highly Cited Researcher according to Shangai Center and Thomson Reuters in the categories of Engineering and Computer Science (in 2014, in 2015, in 2016), therefore, being considered one of the world's most influential scientific researchers.

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*IEEE PIC 2017 Keynote Speech (3)*

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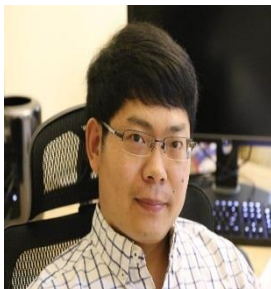
**Towards Precise MRI Brain Imaging Analysis in Computational Psychiatry**

**Kaiming Li**

Professor of Huaxi MR Research Center  
West China Hospital, Sichuan University  
China

**Abstract:**

Psychiatric brain imaging studies in the last three decades have been heavily relying on image registration and group comparison. While registration appears to perform a perfect job in building voxel-wise correspondence across subjects, a foundation of group comparison, a fundamental yet often ignored, if not forgotten, issue in brain imaging analysis is that each every one of us has a unique brain, both structurally and functionally. Moreover, diagnosis of psychotic disorders, mostly based on phenomenology, is still in its cradle stage and may lead to significant heterogeneity within the ‘well-controlled’ patient group. Possibly due to the above two sources of variability, findings of traditional psychiatric studies are prone to inconsistency and thus have lower generalization ability across datasets and population. Recently, emerging efforts have been put to build better correspondence across subjects for comparison and to perform stratified analysis via unsupervised machine learning techniques. In this talk, I will talk about limitations of traditional group comparison studies based on registration, the emerging trend of individualized and stratified brain imaging analysis, and new techniques that tackle and/or study individual variability. Finally, I will discuss how individualized/stratified brain imaging will facilitate discovery and generalization of biomarkers in psychiatric disorders in the era of big data and precision medicine.



**Biography:** Dr. Kaiming Li is a research professor at West China Hospital of Sichuan University. He is interested in how brain works and why doesn't. His research focuses on MRI brain imaging, including algorithm developments using DTI, fMRI, visualisation, and application of them on normal and diseased brains. He was nominated for the best student paper award in ACM 2010 and the best student paper award in ISBI 2011. He is the recipient of Outstanding Ph.D. thesis of Shaanxi Province, China in 2014.

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*IEEE PIC 2017 Keynote Speech (4)*

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**Language Understanding with Knowledge Graph**

**Yanghua Xiao**

Associate Professor of School of Computer Science  
Fudan University  
Shanghai, China

**Abstract:**

It is the capability of language understanding that distinguishes us from animals. And language is the fundamental tools of our thought. Now with the recent development in Artificial Intelligence, we are at the edge to enable machines with the capability to understand human language, which has many real applications and serves as the core component of smart robot brain. However, the current machines still have limited cognitive capability to understand data or text in the form of human language. The underlying reason is that we have no good knowledge bases to support language understanding. In general, the knowledge bases are supposed to have a high coverage over entities and concepts, have rich semantic information, have a high quality and a friendly structure, so that they are useful for machines to understand human language. Recently, more and more online knowledge bases (also known as knowledge graphs) are published. These knowledge graphs are the results of the efforts that extract knowledge from large scale corpora on Web, thus usually contain tens of billions of entities and concepts. These knowledge bases are usually stored as RDF data, which is friendly for machines to use. The heterogeneous knowledge sources cross validate the facts in the knowledge graph, ensuring the high quality of the knowledge graph. Knowledge graphs provide new opportunities to empower machines with the capability to understand natural language. In this speech, I will systematically review the recent progress in enabling machines with the cognitive ability to understand natural language and discuss some open problems. I will first introduce the preliminary concepts of knowledge graphs, with the comparison to traditional knowledge representations. Second, I will overview the recent process about knowledge graph construction, in particular the automatic approaches for knowledge graph construction. The main content of the speech is the language understanding models and algorithms based on knowledge graphs. I will talk about how to use knowledge graphs to enable machines to understand a concept, a set of entities, a verb phrase, a short text and a natural language question. The speech is closed by the discussion about the potential applications of machines' cognitive capability built upon knowledge graphs, including QA on knowledge base, knowledgeable search and recommendation.



**Biography:** Dr Yanghua Xiao got his PHD degree in software theory from Fudan University, Shanghai, China, in 2009. He now is an associate professor of computer science at Fudan University. He is the director of Knowledge Works research laboratory at FUDAN University. He is the vice director of Shanghai Internet Big Data Engineering center. He was awarded with Alibaba Research Fellow and tens of national or local research award. He was also the chief scientists or senior advisors of many top Chinese big

data companies or AI companies. He is also the founder of a AI startup. His research interest includes big data management and mining, graph database, knowledge graph. Recently, he has published 100+ papers in top-tier international journals and conferences, including TKDE, SIGMOD, VLDB, ICDE, IJCAI, AAAI. He is the PI of 30+ research projects supported by national and local funding agencies and big companies including Microsoft, IBM, Baidu, Alibaba, Tencent, HUAWEI, China Telecom, China Mobile and Xiaol Robot etc. He regularly serves as the reviewer of 10+ national and local funding agencies and PC members of 50+ top conferences including IJCAI, AAAI, ICDE, CIKM, SDM. He is the Associate Editor of Frontier of Computer Science, and reviewers of 10+ leading journals. He is a member of ACM, IEEE, AAAI and senior member of CCF. He and his team built and published the largest Chinese knowledge graph CN-DBpedia, and the largest Chinese concept graph CN-Probase. He also built the first knowledge service platform in China ([kw.fudan.edu.cn](http://kw.fudan.edu.cn)), which serves industries with 650Millions+ API calls.



# **Workshop on Hyperspectral & Medical Image Analysis and Applications**

## **Main Issues:**

Recently hyperspectral and image analysis and applications have become a hot topic in high-dimensional signal processing. The aim of this workshop is to bring together the scientists and engineers involved in high dimensional data processing, data representation, advanced methodology and cut-edging techniques in hyperspectral and medical image analysis and applications. Papers with relevant topics are solicited. The main issues are the following areas:

- Structured Sparse, Low Rank and Tensor Representation
- Multimodalities information fusion
- Representation Learning based Image Analysis
- Anomaly detection/Target detection and identification
- Un/Semi-supervised and supervised classification
- Sub-pixel detection in Remote Sensing
- Mixed pixel analysis and Linear spectral unmixing
- Endmember finding and extraction
- High Performance Computing (GPU, Cloud Computing, etc.)
- Medical Image Analysis and Applications
- Applications in Medical Diagnosis, Chemical Detection, Biometric Recognition, etc.

## **Organizer:**

- Prof. Liang Xiao  
School of Computer Science and Engineering  
Nanjing University of Science and Technology, Nanjing China
- Prof. Yinglin Wang  
Shanghai University of Finance and Economics, China
- Prof. Zhihui Wei  
School of Computer Science and Engineering  
Nanjing University of Science and Technology, Nanjing China
- Prof. Qiang Chen  
School of Computer Science and Engineering  
Nanjing University of Science and Technology, Nanjing China
- Associate Prof. Zhichao Lian  
School of Computer Science and Engineering  
Nanjing University of Science and Technology, Nanjing China

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*IEEE PIC 2017 Workshop Keynote Speech (1)*

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**Remote Sensing and Social Media**

**Jun Li**

Professor

Sun Yat-sen University, Guangzhou

China

**Abstract:**

Remote sensing is a powerful technology for Earth observation (EO), and it plays an essential role in many applications, including environmental monitoring, precision agriculture, resource managing, urban characterization, disaster and emergency response, etc. However, due to limitations in the spectral, spatial, and temporal resolution of EO sensors, there are many situations in which remote sensing data cannot be fully exploited, particularly in the context of emergency response (i.e., applications in which real/near-real-time response is needed). Recently, with the rapid development and availability of social media data, new opportunities have become available to complement and fill the gaps in remote sensing data for different applications. In this talk, we will provide an overview of strategies for the integration of social media and remote sensing data in different applications. Several practical case studies and examples are presented in the context of applications focused on emergency response, urban mapping, etc.



**Biography:** Jun Li received the B.S. degree in geographic information systems from Hunan Normal University, Changsha, China, in 2004, the M.E. degree in remote sensing from Peking University, Beijing, China, in 2007, and the Ph.D. degree in electrical engineering from the Instituto de Telecomunicações, Instituto Superior Técnico (IST), Universidade Técnica de Lisboa, Lisbon, Portugal, in 2011. Currently, she is a Professor with Sun Yat-sen University, Guangzhou, China, where she founded her own research group on hyperspectral image analysis and calibration in 2013. Since then, she has obtained several prestigious funding grants at the national and international level. She has published a total of 68 journal citation report (JCR) papers, 48 conference international conference papers, and 1 book chapter. She has received a significant number of citations to her published works, with several papers distinguished as “Highly Cited Papers” in Thomson Reuters’ Web of Science Essential Science Indicators (WoS-ESI). She was elevated to IEEE Senior Member status in 2016. Her students have also obtained important distinctions and awards at international conferences and symposia. Her main research interests comprise remotely sensed hyperspectral image analysis, signal processing, supervised/semisupervised learning and active learning. Prof. Li is an Associate Editor for the IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (since 2014). She has been a Guest Editor for several journals, including the Proceedings of the IEEE and the ISPRS Journal of Photogrammetry and Remote Sensing. She has also been an active reviewer for several journals, including the IEEE Transactions on Geoscience and Remote Sensing, the IEEE Geoscience and Remote Sensing Letters, the IEEE

## **PIC-2017: Technique Program Guide**

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Transactions on Image Processing, Pattern Recognition, Optical Engineering, Journal of Applied Remote Sensing, and Inverse Problems and Imaging. She has received several important awards and distinctions, including the IEEE Geoscience and Remote Sensing Society (GRSS) Early Career Award in 2017, due to her outstanding contributions to remotely sensed hyperspectral and synthetic aperture radar data processing. She was also distinguished as one of the best self-funded Chinese students abroad by the Chinese Scholar Council (in 2010). She was distinguished as a Best Reviewer of the IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (in 2013). One of her students received the Best Student Paper at the 2016 SPIE Remote Sensing Europe Symposium held in Edinburgh, UK for the contribution "A New Tool for Unsupervised Classification of Satellite Images Available on Web Servers: Google Maps as a Case Study" (in September 2016). One of her students received the 2nd prize in the Student Paper competition held at the 2017 IEEE International Geoscience and Remote Sensing Symposium (IGARSS) held in Fort Worth, Texas for the contribution "Hyperspectral Cloud Shadow Removal Based on Linear Unmixing" (in July 2017).

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*IEEE PIC 2017 Workshop Keynote Speech (2)*

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**Hyperspectral image for precision agriculture: applications to disease detection and fruit sorting**

**Wenzhi Liao**

FWO postdoctoral Fellow  
Ghent University, Belgium

**Abstract:**

Recent advances in the sensors technology broaden the scope of hyperspectral imaging in many real applications. These include precision agriculture and food sorting, where hyperspectral image was able to detect plant diseases/fruit bruise several hours before the effects were observed with the naked eye. This talk will review these discoveries and the technologies we developed to enable these discoveries.

Specifically, I will introduce hyperspectral image restoration and its impact on content interpretation. Despite advances in recent sensor technology, degradation (e.g., noise, blur, etc.) cannot be avoided during the hyperspectral images acquisitions, which can affect information retrieval and content interpretation. The first part of my talk will present the techniques we developed for hyperspectral image restoration, with specific applications to potato field mapping and pear flower bud detection. Then, we apply machine learning on time-series hyperspectral images for plant diseases/fruit bruise detection. The objectives are to analyze: (1) how faster the hyperspectral imaging can detect the plant plant diseases/fruit bruise than normal visible RGB image? (2) The symptoms of plant diseases/fruit bruise are very obvious at the later stage, but can be difficult to be detected at the beginning stage, can machine learning learns useful information from the later stage to accurate the earlier decision making?

Last but not least, I will also look to the future: the added values and challenges of fusion of hyperspectral and other data sources for precision applications.



**Biography:** Wenzhi Liao is a FWO postdoctoral Fellow at Ghent University, Belgium. His current research interests include image processing, remote sensing, and pattern recognition. In particular, his interests include hyperspectral image restoration, mathematical morphology, and multisensor data fusion. He received twice the “Best Paper Challenge” Awards on both 2013 IEEE GRSS Data Fusion Contest and 2014 IEEE GRSS Data Fusion Contest. Dr. Liao is a senior member of the IEEE, serving as an Associate Editor for the IET Image Processing.

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*IEEE PIC 2017 Workshop Keynote Speech (3)*

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**Deep Convolutional Neural Networks for Hyperspectral Image Classification**

**Wei Li**

Professor, College of Information Science and Technology  
Beijing University of Chemical Technology,  
China

**Abstract:**

Hyperspectral imagery consists of hundreds of narrow contiguous wavelength bands carrying a wealth of spectral information. Taking advantages of the rich spectral information, classification using hyperspectral data has been developed for a variety of applications, such as earth observation of remote sensing, medical disease diagnosis, and pest detection of food safety, etc.

Recently, deep convolutional neural networks (CNN) have drawn increasing attention with its advantages of feature extraction. In this talk, shortcomings of employing deep CNN in hyperspectral image classification tasks are analyzed, such as limited training data causing insufficiently-learned deep architecture; and then, an interesting pixel-pair features (PPF) are presented to overcome this problem, which tend to be more discriminative and reliable. Subsequently, a novel two-branch CNN model of exploiting useful high-level information from multisource data for earth observation is introduced. In this work, a two-tunnel CNN framework is firstly designed to extract spectral-spatial features in hyperspectral imagery; furthermore, CNN with cascade block is employed for feature extraction from other multiple sensors (e.g., LiDAR). The proposed algorithm has demonstrated superior performance compared to existing methods. At the end of this talk, some open issues are noticed, which need more research.



**Biography:** Wei Li is currently a full professor with the College of Information Science and Technology at Beijing University of Chemical Technology, Beijing, China. His research interests include hyperspectral image processing, feature extraction, image classification, anomaly detection, etc. He has published more than 100 peer-reviewed articles and conference papers. Dr. Li served as section chairs for the International Geoscience and Remote Sensing Symposium (IGARSS) 2016, the International Conference on Intelligent Earth Observing and Applications (IEOA) 2015, and the International Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (Whispers) 2015. He served as program committee for the 8th IAPR Workshop on Pattern Recognition in Remote Sensing 2014. Dr. Li is a guest editor for the special issues of Remote Sensing, Journal of Real Time Image Processing, and IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS). Dr. Li received the 2015 Best Reviewer from IEEE Geoscience and Remote Sensing Society (GRSS) for his service for IEEE JSTARS.

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*IEEE PIC 2017 Workshop Keynote Speech (4)*

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**Hyperspectral Imagery Restoration: Low Rank Perspective**

**Yongqiang Zhao**

Professor, School of Automation

Northwestern Polytechnical University, Xian

China

**Abstract:**

Hyperspectral imaging (HSI) is an emerging sensing technology that integrates conventional imaging and spectroscopy to attain both spatial and spectral information from observed scene. Due to the instrument limitation and imperfect imaging optics, it is difficult for HSI sensors to acquire high-quality (high signal-to-noise ratio, high spatial resolution, no blur and no stripe) data. Low-quality will greatly degrade the detection and recognition performance required in the civil and military fields. At the same time, improving hyperspectral imagery quality by modifying the imaging optics or sensor array is not an easy option. Therefore, hyperspectral imagery restoration (HSIR) has become an important topic to acquire the high quality data by post processing as a better alternative. HSIR is a typical ill-posed inverse problem. Due to the large space of hyperspectral imagery contents, prior information on hyperspectral imagery structures is crucial to regularize the solution space and produce a good estimation of the latent image. Hyperspectral data cube is highly correlate image set, it has an intrinsic low-rank structure. In this representation, we will introduce how to utilize the low-rank regularization for restore high quality hyperspectral image and what we have done in this filed. To evaluate the quality of reconstructed hyperspectral imagery, we analyze the statistics in both spatial and spectral domains of HSI, and then give a no-reference hyperspectral image quality assessment method.



**Biography:** Yongqiang Zhao is currently a Professor in School of Automation, Northwestern Polytechnical University with research interests in polarization imaging analysis, hyperspectral image processing, deep learning, image fusion. He received the B.S. degree in automation and the M.S. and Ph.D. degrees in control theory and control engineering from the Northwestern Polytechnical University, Xi'an, China, in 1998, 2001, and 2004, respectively. From 2007 to 2009, he worked as a Postdoctoral Researcher at McMaster University, Hamilton, ON, Canada and Temple University, Philadelphia, PA, respectively. He is the Guest Editor of Remote Sensing and Journal of Sensors.

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*IEEE PIC 2017 Workshop Keynote Speech (5)*

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**Density Clustering and Superpixel Guided Approaches for Hyperspectral Image Processing**

**Sen Jia**

Professor

College of Computer Science and Software Engineering, Shenzhen University  
China

**Abstract:**

In this talk, I will present the recent work of our group on hyperspectral image processing. Firstly, an enhanced Density peak-based clustering method is introduced for hyperspectral band selection, which has several advantages, such as high efficiency, good representative property of the chosen bands, etc. Meanwhile, an effective strategy is developed to automatically determine the appropriate number of bands to be selected. Secondly, two superpixel guided techniques are provided for hyperspectral image classification. On one hand, the superpixel map is used to simplify the dimensionality reduction process; on the other hand, a region merging process is applied to make the superpixels obtained more homogeneous and agree with the spatial structure of materials more precisely, and the estimation of the number of extracted superpixel is unnecessary. Finally, future work about the two topics is discussed.



**Biography:** Sen Jia received his B.E. and Ph.D degrees from College of Computer Science, Zhejiang University in 2002 and 2007, respectively. He is currently a Professor with the College of Computer Science and Software Engineering, Shenzhen University, China. His research interests include hyperspectral image classification, machine learning and pattern recognition. He is a senior member of the IEEE, and received the IEEE JSTARS 2014 Best Reviewer Award. He has been supported by several talent programs, such as Guangdong Special Support Program of Top-notch Young Professionals (2016), Guangdong Foundation of Outstanding Young Teachers in Higher Education Institutions (2014), etc.

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*IEEE PIC 2017 Workshop Keynote Speech (6)*

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**Neuroimaging Studies of Chinese Children with Autism**

**Xiaoyan Ke**

Director of Nanjing Child Mental Health Research Center, Nanjing Brain Hospital  
Professor, Nanjing Medical University  
China

**Abstract:**

In China, Dr. Guotai Tao was the first clinician who reported the first case of autism in 1982. To explore the neurobiological basis of ASD, more than 200 studies over the past 20 years have proposed neuroanatomical changes using MRI technology. We summarized findings from studies based on voxel-based morphometry, surface-based morphometry, and tensor-based morphometry, and diffusion-tensor imaging. Besides these clinical services, several MRI research works have been carried out in recent years in our team. The purposes of these studies tried to answer the following questions: 1) What kind of brain structural changes in children with ASD in different ages? 2) What's relationship between specific regions of brain and ASD symptoms? 3) Whether the brain structural abnormality is benefit to the diagnosis of ASD?



**Biography:** Dr. Ke is director of Nanjing Child Mental Health Research Center, a research professor at Nanjing Medical University. She is interest in looking for biomarkers of MRI brain imaging in autism spectrum disorders. Her research focuses on the study of the predictive index and its curative effect using the brain imaging of multivariate magnetic resonance in children with autism spectrum disorders and the establishment of early diagnosis and prediction model for children with autism spectrum disorder. She is a Key talent of Medicine in Jiangsu Province (2016), a Second level of cultivating talents of 333 program in Jiangsu Province (2016), outstanding contribution and middle-aged and young experts in Jiangsu Province (2016).



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*IEEE PIC 2017 Workshop Keynote Speech (7)*

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**Machine Learning in Functional Brain Imaging Analysis**

**Xi Jiang**

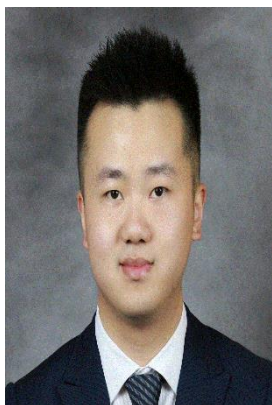
Associate Professor

University of Electronic Science & Technology of China (UESTC)

China

**Abstract:**

Machine learning such as dictionary learning and deep learning has received increasing interest in functional brain imaging analysis. In this talk, I will discuss our recent studies using dictionary learning and deep learning for two applications of functional brain imaging analysis. Specifically, 1) we perform a series of experiments to explore the functional difference between gyri and sulci. Cortical folding, which is composed of convex gyri and concave sulci, is one of the most prominent features of human brain. The studies of functional difference between gyri and sulci will help the understanding of brain function mechanism. 2) We design a computational framework to identify connectome-scale group-wise consistent resting-state brain networks, and further apply those networks as potential biomarkers to differentiate autism spectrum disorder patients from normal controls.



**Biography:** Dr. Xi Jiang is currently an associate professor of University of Electronic Science & Technology of China (UESTC). He is also affiliated with Key Laboratory for NeuroInformation of Ministry of Education in UESTC. He received his B.S. degree in Northwestern Polytechnical University in 2009, and Ph.D. degree in University of Georgia, US in 2016. He worked as a research assistant and postdoctoral associate from 2010 to 2016 in Department of Computer Science, University of Georgia, US. His research interests include brain MRI image processing and analysis via machine learning and computational modeling, and its applications in cognitive neuroscience and clinical studies. He has been serving as reviewer for more

than 20 journals and conference proceedings such as NeuroImage, MICCAI, etc. He has published more than 90 journal papers and conference proceedings. He is the recipient of Chinese Government Award for Outstanding Students Abroad in 2016, Outstanding Graduate Student Award in University of Georgia, Computer Science Department in 2016, best paper candidate of IEEE International Symposium on Biomedical Imaging in 2014, Trainee Abstract Travel Award of Organization for Human Brain Mapping (OHBM) Annual Meeting in 2013, and Outstanding Graduate Award of Shaanxi Province, P.R. China in 2009.

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*IEEE PIC 2017 Workshop Keynote Speech (8)*

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**Cumulative dose of radiation therapy of hepatocellular carcinoma patients and its deterministic relation to radiation-induced liver disease**

**Dengwang Li**

Vice Dean of School of Physics and Electronics  
Professor, Shandong Normal University  
China

**Abstract:**

To investigate the relationship between dose and radiation-induced liver disease (RILD) in patients with hepatocellular carcinoma (HCC) receiving 3-dimensional conformal radiotherapy (3DCRT). Deformable registration of planning CT (pCT) and CBCT was performed to acquire modified CBCT (mCBCT), and the structural contours were propagated by the deformable registration. The same plan was applied to mCBCT to perform dose calculation. The daily doses were summed together with the help of deformable registration to obtain the adjusted cumulative dose. The result found that RILD patients received liver dose higher than hepatic radiation tolerance, and determination of a reconstructed cumulative dose using the mCBCT scans are more accurate in predicting RILD and has the potential to reduce the risk of RILD.



**Biography:** Dr. Dengwang Li was born in Shanxi Province, China. He received his B.S. degree from Shandong University, in China. He earned his Ph.D. degree also from Shandong University, and won a joint Ph.D. program with the University of Sydney. After that, he worked in Stanford University as Postdoctoral Research Associate for 3 years. He holds the position of full professor in the school of physics and electronics at Shandong Normal University since 2016. His research focused on signal processing and biomedical engineering. Now, he is the Vice Dean of School of Physics and Electronics, Vice Dean of Institute of Biomedical Sciences, and Vice Director of Shandong Province Key Laboratory of Medical Physics and Image Processing Technology.

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*IEEE PIC 2017 Workshop Keynote Speech (9)*

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**Application of Digital Medicine in Oncology**

**Yi Wu**

Associate Professor

Third Military Medical University

China

**Abstract:**

Cancer is a very horrible disease to human being and is a killer only second to cardiovascular diseases. From WHO report, only 55% cancer can cure. Accuracy of cure need improve and the complication need cut down. Digital Medicine is a new subject combining modern informatics technique and medicine and it includes digital anatomy, medical image analysis , surgical navigation, surgery simulation and radiotherapy simulation. We present our work about our digital medicine study in cancer diagnosis and treatment including digital radiotherapy, digital imaging diagnosis, digital surgical navigation and 3D printing help diagnosis and tumor dissection, which help to improve cancer's diagnostic rate, and treatment precision.



**Biography:** Dr. Yi Wu is an associate professor of Institute of Digital Medicine, Third Military Medical University, and visiting scholar of University of Amsterdam in the Netherlands. He is also the deputy director of the youth committee, digital medical branch of Chinese medical association, and Committee member of Branch of Human Anatomy and Digital Anatomy of the Chinese Association of Anatomy, Committee of Digital Medical Society in Chongqing, Committee Anatomy Society in Chongqing, Committee of International Digital Medical Society and Secretary General of Anatomical Society of Military Medical Association. His main research fields include Chinese Visible Human, Digital Anatomy and Digital Medicine. As the first author, he has published more than 10 journal articles in recent years, accumulative total 15 SCI articles. He is currently in charge of 5 projects including National Key Research and Developmental Project, National Natural and Science Foundation of China, Military Medical Foundation, Chongqing High-educational Reform Project.

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*IEEE PIC 2017 Workshop Keynote Speech (10)*

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**Functional connectivity analysis in spinal cord injured Rhesus monkeys**

**Jia-Sheng Rao**

Assistant Professor  
Beihang University  
China

**Abstract:**

Spinal cord injury (SCI) disrupts the ascending and descending nerve fibers, which always lead to sensorimotor dysfunction. In SCI animal studies, it is difficult to assess the function of residual sensory pathways in vivo. Somatosensory evoked potential (SEP) is a useful technique, but in some cases, such as hemi-transected SCI, current stimulation always bring confusions due to the complex cross fibers. To evaluate the alteration of brain resting-state functional connectivity (FC) induced by SCI, five adult female Rhesus monkeys (weight:  $5\pm 1$ kg; year: 4-6) were used for this study. The experimental procedures had been approved by the Biomedical Ethics Committee of the Beihang University. Under an operation microscope, a hemi-section with excision 1cm tissue was performed at monkeys' right side of thoracic spinal cord (T7-9 level). Resting-state functional magnetic resonance imaging (fMRI) examination was performed on anesthetized animals in the healthy stage and 1, 2, 3, 6, and 12 months post-operation by using a 3T MR scanner (Siemens). The data were processed using SPM8 and DPARSFA. Each volume was spatial normalization to INIA19 Primate Brain Atlas. 16 ROIs in the sensorimotor cortex and default mode network (DMN) were defined based on the INIA19 Atlas. The average time series of all voxels in each ROI were extracted and were calculated by using Pearson's correlation analysis to form the FC maps. Fisher's  $r$  to  $z$  transformation was used to improve the data normality. A paired t-test was used to detect the significant difference between healthy and each time-point post-SCI ( $p < 0.05$  with Bonferroni multiple correction). This study demonstrated partial SCI induces long-term FC regulation in the sensorimotor cortex and DMN of non-human primate brain. These findings may give a potential insight into the research on spontaneous recovery and reorganization of brain functions after SCI.



**Biography:** Dr. Jia-Sheng Rao received the Ph.D. degree in Biomedical Engineering from Beihang University in 2016. He is currently an Assistant Professor of Biomedical Engineering with the Department of Biomedical Engineering and the Beijing Key Laboratory for Biomaterials and Neural Regeneration, Beihang University. His current research interests include neuroimaging by magnetic resonance imaging, assessment of central nerve system injury, medical imaging processes and analyses, and rehabilitation engineering. He is the key member of the Nation Science and Technology Program, International Cooperation in Science and Technology Projects, National Natural Science Foundations. He has published 14 papers and 8 were indexed by ISI's SCI, with 6 papers in the JCR rank of Q1 and Q2. His h-index is 4 according to the Web of Science with 38 citations received.

## Hotel & Main Conference Venue

### Hotel - 1:

**NanjingQinglv Hotel:** QinHuaiQu, HouBiaoYing Road 101

（南京青旅宾馆，中国电子集团 28 所院内，秦淮区后标营路 101 号，近童卫路）



### Hotel - 2:

**JinjiangZhixing Hotel:** QinHuaiQu, HouBiaoYing Road 88-1

（锦江之星宾馆，秦淮区后标营路 88-1 号）





### Registration:

1. **Location:** NanjingQinglv Hotel: QinHuaiQu, Houbiaoying Road 101  
(南京青旅宾馆, 中国电子集团 28 所院内, 秦淮区后标营路 101 号, 近童卫路)  
**Time: Dec.15 8:00-22:00**
2. **Location:** 1st Floor, Report Room, New Library, NJUST  
(南京理工大学新图书馆一楼报告厅)  
**Time: Dec.16-Dec.17 8:30-18:00**



New Library, NJUST



The Map of New Library, NJUST

## Important Information

From The Registration Hotel to the Main Conference Venue

※ On foot: 2.2 km, about 20 minutes



### 注意:

- ※ 会议注册时间为 15 号 8:00-22:00, 青旅宾馆; 16 号-17 号移至会议开会地点南京理工大学新图书馆一楼报告厅
- ※ 本次会议 YOCSEF- Nanjing AC 委员, 江苏省人工智能协会模式识别专委会委员、江苏省图形图像专委会委员参会免费(无论文集、食宿自理)
- ※ 其他参会者如需论文集、会议礼品和会议 Break coffee, 会议 Banquet, 需注册以 attendee 身份进行会议注册, 会议注册费为 1000 RMB,并提供会议注册费发票.
- ※ 12 月 16 日 晚宴 Banquet 可单独购买, 300RMB/人. (南京理工大学紫麓宾馆)

# Banquet

✧ **Time:** Dec 16, 18:30-21:00

✧ **Location:** Zilu Hotel  
(南京理工大学紫麓宾馆)

✧ **How to Reach the Dinner Place:**





Qinglv Hotel

- 1: From the Qinglv Hotel to New Library (NUJST) is about 2 Km, 20 mins on foot.
2. From New Library (**Main conference Venue**) to Zilu Hotel (**for Lunch and Diner**) is about 500 m, 5 mins on foot
3. You can rent shared bikes.

