

# **2015 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications**

**(CIVEMSA 2015)**

**Shenzhen, China  
12-14 June 2015**



**IEEE Catalog Number: CFP15CVA-POD  
ISBN: 978-1-4799-6093-4**

# TABLE OF CONTENTS

MESSAGE FROM THE CHAIRPERSONS.....	x
IEEE CIVEMSA 2015 ORGANIZERS .....	xi
IEEE CIVEMSA 2015 TECHNICAL PROGRAM COMMITTEE .....	xii

## Friday, June 12

10:30 - 13:00

### Intelligent Measurement Systems

Session Chair: Dr. Feng Wan, University of Macau, P.R. China

<b>Reliability and Sensitivity Analysis on the Center of Pressure Measures in Healthy Young Adults Using Nintendo Wii Balance Board.....</b>	<b>1</b>
<i>Xiaoting Qu (University of Macau, Macau)</i>	
<i>Wenya Nan (University of Macau, Macau)</i>	
<i>Chi Man Wong (University of Macau, Macau)</i>	
<i>Feng Wan (University of Macau, Macau)</i>	
<i>Yong Hu (University of Hong Kong, Hong Kong)</i>	
<b>Novelty Detection based on Extensions of GMMs for Industrial Gas Turbines.....</b>	<b>5</b>
<i>Yu Zhang (University of Lincoln, United Kingdom)</i>	
<i>Chris Bingham (University of Lincoln, United Kingdom)</i>	
<i>Michael Gallimore (University of Lincoln, United Kingdom)</i>	
<i>Darren Cox (Siemens Industrial Turbomachinery LTD, United Kingdom)</i>	
<b>Intelligent Magnetostrictive Measurement Technology for Loss Rate of Cross-sectional Area of Rectangular Notch.....</b>	<b>10</b>
<i>Zhihui Zhou (Harbin Institute of Technology Shenzhen Graduate School, P.R. China)</i>	
<i>Donglai Zhang (Harbin Institute of Technology Shenzhen Graduate School, P.R. China)</i>	
<i>Jinping Sun (Harbin Institute of Technology Shenzhen Graduate School, P.R. China)</i>	
<i>Enchao Zhang (Harbin Institute of Technology Shenzhen Graduate School, P.R. China)</i>	
<i>Shimin Pan (Harbin Institute of Technology Shenzhen Graduate School, P.R. China)</i>	
<i>Anshou Li (Harbin Institute of Technology Shenzhen Graduate School, P.R. China)</i>	
<b>Multivariable Dynamic System Fault Diagnosis Using Nonlinear Spectrum and SVM Fusion .....</b>	<b>15</b>
<i>Jialiang Zhang (Xi'an Jiaotong University, P.R. China)</i>	
<i>Jianfu Cao (Xi'an Jiaotong University, P.R. China)</i>	
<i>Feng Gao (Xi'an Jiaotong University, P.R. China)</i>	
<b>Using Distance Estimation and Deep Learning to Simplify Calibration in Food Calorie Measurement .....</b>	<b>21</b>
<i>Pallavi Kuhad (University of Ottawa, Canada)</i>	
<i>Yassine Abdulsalam (University of Ottawa, Canada)</i>	
<i>Shervin Shirmohammadi (University of Ottawa, Canada)</i>	

14:00 - 16:00

**Computational Intelligence for Medical and Bioengineering Applications**

**Session Chair:** Dr. Jiangbo Pu, IBME CAMS, P.R. China

**Non-contact Measurement of Respiratory and Heart Rates Using a CMOS Camera-equipped Infrared Camera for Prompt Infection Screening at Airport Quarantine Stations .....27**

*Yosuke Nakayama (Tokyo Metropolitan University, Japan)*

*Guanghao Sun (Tokyo Metropolitan University, Japan)*

*Shigeto Abe (Tokyo Metropolitan University, Japan)*

*Takemi Matsui (Tokyo Metropolitan University, Japan)*

**A Dynamic Prediction Model for Intraoperative Somatosensory Evoked Potential Monitoring .....31**

*Hongyan Cui (Peking Union Medical College, P.R. China)*

*Xiaobo Xie (Peking Union Medical College, P.R. China)*

*Shengpu Xu (Peking Union Medical College, P.R. China)*

*Yong Hu (University of Hong Kong, Hong Kong)*

**Noise Reduction of ECG Signals through Genetic Optimized Wavelet Threshold Filtering .....36**

*Hong He (Shanghai Normal University, P.R. China)*

*Zheng Wang (Shanghai Normal University, P.R. China)*

*Yonghong Tan (Shanghai Normal University, P.R. China)*

**Comparison of Photometric Stereo and Spectral Analysis for Visualization and Assessment of Burn Injury from Hyperspectral Imaging .....42**

*Houzhong Ding (Stevens Institute of Technology, USA)*

*Robert C. Chang (Stevens Institute of Technology, USA)*

16:30 - 18:30

**Intelligent Monitoring and Control Systems**

**Session Chair:** Dr. Vincenzo Paciello, University of Salerno, Italy

**Operational Pattern Analysis for Predictive Maintenance Scheduling of Industrial Systems .....48**

*Yu Zhang (University of Lincoln, United Kingdom)*

*Chris Bingham (University of Lincoln, United Kingdom)*

*Michael Gallimore (University of Lincoln, United Kingdom)*

*Sepehr Maleki (University of Lincoln, United Kingdom)*

**Smart Meters and Demand response: a Double Challenge .....53**

*Giuseppe Di Leo (University of Salerno, Italy)*

*Consolatina Liguori (University of Salerno, Italy)*

*Vincenzo Paciello (University of Salerno, Italy)*

*Antonio Pietrosanto (University of Salerno, Italy)*

*Paolo Sommella (University of Salerno, Italy)*

**Steering Pulse Model for Vehicle Lane Keeping .....59**

*Timothy Gordon (University of Lincoln, United Kingdom)*

*Yu Zhang (University of Lincoln, United Kingdom)*

**Towards Visual Smart Metering exploiting wM-Bus and DLMS/COSEM .....64**

*G. Di Leo (University of Salerno, Italy)*

*C. Liguori (University of Salerno, Italy)*

*V. Paciello (University of Salerno, Italy)*

*A. Pietrosanto (University of Salerno, Italy)*

*P. Sommella (University of Salerno, Italy)*

## Saturday, June 13

8:30 -10:30

### Image Understanding and Recognition

Session Chair: Prof. Guanglin Li, SIAT, P.R. China

<b>Action Recognition by Huffman Coding and Implicit Action Model .....</b>	<b>70</b>
<i>Nijun Li (Southeast University, P.R. China)</i>	
<i>Tongchi Zhou (Southeast University, P.R. China)</i>	
<i>Lin Zhou (Southeast University, P.R. China)</i>	
<i>Zhenyang Wu (Southeast University, P.R. China)</i>	
<b>Content Based Image Retrieval by IPP algorithm .....</b>	<b>76</b>
<i>Jia Song (Beijing Institute of Technology, P.R. China)</i>	
<i>Zunwen He (Beijing Institute of Technology, P.R. China)</i>	
<b>A Background Subtraction Algorithm for Indoor Monitoring Surveillance System .....</b>	<b>80</b>
<i>Mohamed Bachir Boubekour (Beijing Institute of Technology, P.R. China)</i>	
<i>SenLin Luo (Beijing Institute of Technology, P.R. China)</i>	
<i>Hocine Labidi (Beijing Institute of Technology, P.R. China)</i>	
<b>An Effective Algorithm for Generation of Crater Gray Image .....</b>	<b>85</b>
<i>Tingting Lu (Beihang University, P.R. China)</i>	
<i>Weiduo Hu (Beihang University, P.R. China)</i>	
<i>Zhiliang Jiang (Beijing Institute of Electro-machining, P.R. China)</i>	
<b>11:00 - 13:00</b>	
<b>Neural and Fuzzy Techniques</b>	
Session Chair: Dr. Yu Zhang, University of Lincoln, United Kingdom	
<b>Fuzzy Inference System as decision-maker to automate cryo-EM data acquisition on a transmission electron microscope .....</b>	<b>91</b>
<i>David Gil-Carton (Cooperative Center for Research in Biosciences, Spain)</i>	
<i>Mikel Valle (Cooperative Center for Research in Biosciences, Spain)</i>	
<i>Aitor J Garrido (University of the Basque Country, Spain)</i>	
<i>Izaskun Garrido (University of the Basque Country, Spain)</i>	
<i>Iñigo Miguel (University of the Basque Country, Spain)</i>	
<b>Variational Bayesian Modified Adaptive Mamdani Fuzzy Modelling for use in Condition Monitoring .....</b>	<b>97</b>
<i>Yu Zhang (University of Lincoln, United Kingdom)</i>	
<i>Jun Chen (University of Lincoln, United Kingdom)</i>	
<i>Chris Bingham (University of Lincoln, United Kingdom)</i>	
<i>Timothy Gordon (University of Lincoln, United Kingdom)</i>	
<b>Fuzzy logic based mobile robot target tracking in dynamic hostile environment .....</b>	<b>102</b>
<i>Tharindu Fernando (University of Peradeniya, Sri Lanka)</i>	
<i>Harshala Gammulle (University of Peradeniya, Sri Lanka)</i>	
<i>Chamila Walgampaya (University of Peradeniya, Sri Lanka)</i>	

**Overcurrent Relay Curve Modeling and Its Application in the Real Industrial Power Systems Using Adaptive Neuro Fuzzy Inference System ..... 108**

*Anang Tjahjono (Politeknik Elektronika Negeri Surabaya, Indonesia)*  
*Dimas Okky Anggriawan (Institut Teknologi Sepuluh Nopember, Indonesia)*  
*Ardyono Priyadi (Institut Teknologi Sepuluh Nopember, Indonesia)*  
*Margo Pujiantara (Institut Teknologi Sepuluh Nopember, Indonesia)*  
*Mauridhi Hery Purnomo (Institut of Teknologi Sepuluh Nopember, Indonesia)*

**14:00 - 16:00**

**Human-computer Interaction**

**Session Chair:** Prof. Hairong Zheng, SIAT Shenzhen, P.R. China

**Improving Fingerprint Based Access Control System Using Quick Response Code ..... 114**

*Xiangpeng Fu (Inner Mongolia University, P.R. China)*  
*Kaiying Feng (Inner Mongolia University, P.R. China)*  
*Changzhong Wang (Inner Mongolia University, P.R. China)*  
*Junxing Zhang (Inner Mongolia University, P.R. China)*

**A Multi-Channel SSVEP-based BCI for Computer Games with Analogue Control..... 119**

*Chi Man Wong (University of Macau, Macau)*  
*Qi Tang (University of Macau, Macau)*  
*Janir Nuno da Cruz (University of Macau, Macau)*  
*Feng Wan (University of Macau, Macau)*

**Perceived Mental Workload and Operator Performance of Dexterous Manipulators under Time Delay with Master-Slave Interfaces ..... 125**

*Daniel Cannon (Carnegie Mellon University, USA)*  
*Mel Siegel (Carnegie Mellon University, USA)*

**Application of VI technology in DSO Measurement System with GPIB Interface ..... 131**

*Chi He (Changchun University of Science and Technology, P.R. China)*  
*Long Ma (Changchun University of Science and Technology, P.R. China)*  
*Yong Wu (China Baicheng Ordnance Test Center, P.R. China)*  
*Guangling Dong (China Baicheng Ordnance Test Center, P.R. China)*  
*Qiang Li (China Baicheng Ordnance Test Center, P.R. China)*

**16:30 - 18:30**

**Multimodal Sensing and Multi-sensor Data Fusion**

**Session Chair:** Dr. Zheng Wang, The University of Hong Kong, Hong Kong

**Data-driven Analysis of Kinaesthetic and Tactile Information for Shape Classification ..... 136**

*Thiago Eustaquio Alves de Oliveira (University of Ottawa, Canada)*  
*Vinicius Prado da Fonseca (University of Ottawa, Canada)*  
*Emanuil Huluta (University of Ottawa, Canada)*  
*Paulo F.F. Rosa (The Military Institute of Engineering, Brazil)*  
*Emil M. Petriu (University of Ottawa, Canada)*

**CRLB-Weighted Intersection Method for Target Localization using AOA Measurements ..... 141**

*Zhansheng Duan (Xi'an Jiaotong University, P.R. China)*  
*Qi Zhou (Xi'an Jiaotong University, P.R. China)*

**PLS Initialized Sequential Estimator for Target Localization Using AOA Measurements ..... 147**

*Yanzi Wang (Xi'an Jiaotong University, P.R. China)*  
*Zhansheng Duan (Xi'an Jiaotong University, P.R. China)*

**Virtual Geographic Environment Based Coach Passenger Flow Forecasting .....153**  
*Zhihan Lv (SIAT, P.R. China)*  
*Xiaoming Li (SIAT, P.R. China)*  
*Jinxing Hu (SIAT, P.R. China)*  
*Ling Yin (SIAT, P.R. China)*  
*Baoyun Zhang (JIAT, P.R. China)*  
*Shengzhong Feng (SIAT, P.R. China)*

## Sunday, June 14

8:30 -10:30

### Sensors, Displays, and Object Modeling

Session Chair: Prof. Yong Hu, The University of Hong Kong, Hong Kong

<b>Stochastic Petri Nets For Very Short-Term Wind Speed Modeling</b> .....	159
<i>Ratna Ika Putri (Institut Teknologi Sepuluh Nopember, Indonesia)</i>	
<i>Ardyono Priyadi (Institut Teknologi Sepuluh Nopember, Indonesia)</i>	
<i>Mauridhi Purnomo (Institut of Technology Sepuluh Nopember, Indonesia)</i>	
<b>Sizing Compressed-Air Energy Storage Tanks for Solar Home Systems</b> .....	163
<i>A. Setiawan (Institut Teknologi Sepuluh Nopember, Indonesia)</i>	
<i>A. Priyadi (Institut Teknologi Sepuluh Nopember, Indonesia)</i>	
<i>M. Pujiantara (Universitas Jember, Indonesia)</i>	
<i>M. H. Purnomo (Institut of Teknologi Sepuluh Nopember, Indonesia)</i>	
<b>A three-axis optical electric field sensor for high-altitude nuclear electromagnetic pulse (HNEMP) measurement</b> .....	167
<i>Jiahong Zhang (University of Electronic Science and Technology of China, P.R. China)</i>	
<i>Fushen Chen (University of Electronic Science and Technology of China, P.R. China)</i>	
<i>Bao Sun (University of Electronic Science and Technology of China, P.R. China)</i>	
<i>Kaixin Chen (University of Electronic Science and Technology of China, P.R. China)</i>	
<i>Lei Wang (University of Electronic Science and Technology of China, P.R. China)</i>	
<b>Over Provisioning Rate in Three-dimensional Wireless Sensor Networks for Partial Sensing Coverage</b> .....	171
<i>Yun Wang (Bradley University, USA)</i>	
<b>11:00 - 13:00</b>	
<b>Miscellaneous Topics</b>	
Session Chair: Prof. Yh Chen, Taipei Municipal University of Education, Taiwan	
<b>A Tunable Optoelectronic Oscillator Based on Single Sideband Modulation and Stimulated Brillouin Scattering</b> .....	177
<i>Chengxin Li (University of Electronic Science and technique of China, P.R. China)</i>	
<i>Fushen Chen (University of Electronic Science and technique of China, P.R. China)</i>	
<i>Jiahong Zhang (University of Electronic Science and technique of China, P.R. China)</i>	
<b>Optimal sample size allocation for integrated test scheme</b> .....	180
<i>Guangling Dong (Baicheng ordnance test center of China, P.R. China)</i>	
<i>Chi He (Baicheng ordnance test center of China, P.R. China)</i>	
<i>Zhengguo Dai (Baicheng ordnance test center of China, P.R. China)</i>	
<b>XEarth: A 3D GIS Platform for managing massive city information</b> .....	184
<i>Xiaoming Li (SIAT, P.R. China)</i>	
<i>Zhihan Lv (SIAT, P.R. China)</i>	
<i>Jinxing Hu (SIAT, P.R. China)</i>	
<i>Baoyun Zhang (JIAT, P.R. China)</i>	
<i>LingYan Shi (ZZIA, P.R. China)</i>	
<i>Shengzhong Feng (SIAT, P.R. China)</i>	
<b>Sharpness tracking algorithm for stereo microscope</b> .....	190
<i>Alexandra Afanasyeva (Moscow State University, Russia)</i>	
<i>Alexey Ignatenko (Moscow State University, Russia)</i>	

14:00 - 16:00

**Intelligent Monitoring and Control Systems II**

**Session Chair:** Dr. Zhiguo Zhang, Nanyang Technological University, Singapore

**Intelligent Gateway for SCADA System Security: A Multi-Layer Attack Prevention Approach .....196**

*Biswajit Panja (University of Michigan-Flint, USA)*

*Josh Oros (University of Michigan-Flint, USA)*

*Jaime Britton (University of Michigan-Flint, USA)*

*Priyanka Meharia (Eastern Michigan University, USA)*

*Sourav Pati (University of Michigan-Flint, USA)*

**Novel method for failure prognostics of power MOSFET .....202**

*Min Zhao (Harbin Institution of Technology, P.R. China)*

*Zhicheng Zhou (China Academy of Space Technology, P.R. China)*

*Donglai Zhang (Harbin Institution of Technology Shenzhen Graduate School, P.R. China)*

*Tiecai Li (Shenzhen Academy of Aerospace Technology, P.R. China)*

*Zicai Wang (Shenzhen Academy of Aerospace Technology, USA)*

**Human Target Detection and Tracking Under Parallel Binocular Cameras .....206**

*Yufeng Xing (Shanghai University, P.R. China)*

*Qiuyu Zhu (Shanghai University, P.R. China)*

*Sai Yuan (Shanghai University, P.R. China)*

*Baozhu Zhao (Shanghai University, P.R. China)*

**Virtual Measurement of Spacecraft Solar Array Power Loss in Partially Shaded Condition .....211**

*Yang Yang (Harbin Institute of Technology Shenzhen, P.R. China)*

*Donglai Zhang (Harbin Institute of Technology Shenzhen, P.R. China)*

*Weiwen Guo (Guangzhou Ropen Technology Co. Ltd., P.R. China)*

16:30 - 18:00

**Computational Intelligence for Medical and Bioengineering Applications II**

**Session Chair:** Dr Zhiguo Zhang, Nanyang Technological University, Singapore

**Adaptive Fourier Decomposition Approach for Lung-Heart Sound Separation .....215**

*Ze Wang (University of Macau, Macau)*

*Janir Nuno da Cruz (University of Macau, Macau)*

*Feng Wan (University of Macau, Macau)*

**A novel dot-plot algorithm for surface EMG signal segment identification .....220**

*Enoch C.Y. Sit (The University of Hong Kong, Hong Kong)*

*Yong Hu (The University of Hong Kong, Hong Kong)*

**Exploratory Analysis of Time-Varying Functional Connectivity in a Visual Task .....226**

*Jingjun Wong (The University of Hong Kong, Hong Kong)*

*Zhiguo Zhang (Nanyang Technology University, Singapore)*

**AUTHOR INDEX .....231**