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Program

Instruction for Speakers

The allocation of time:

Healthcom Presentation: 16 minutes presentation + 4 minutes A/Q
Workshop Presentation: 16 minutes presentation + 4 minutes A/Q

Title/Number of paper, all of authors' name, and Electronic Presentation (PPT or PDF) should be sent to us one day earlier.
(Please send the mail to: dlsmartcity@hotmail.com or directly copy to the volunteers at work)

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Chair: Changqing Ji (Dalian University, P.R. China)
Dinner Time

Chair: Jing Qin (Dalian University, P.R. China)

Open Ceremony

Chair: Zumin Wang (Dalian University, P.R. China)

K1: Keynote 1: The U.S. Food and Drug Administration’s Database of Medical Device Adverse Events

Chair: Lei Shu (Guangdong University of Petrochemical Technology, P.R. China)

Abstract: The U.S. Food and Drug Administration (FDA) has developed a Manufacturer and User Facility Device Experience (MAUDE) database, which stores the reports of adverse medical device events. Each adverse event report has an event description and is labeled with a variety of information such as "product problem". This information is submitted by technicians, hospital staff as well as the manufacturers of the medical devices. Given this database and the methods of data-mining "big-data", there are now many opportunities to glean previously unknown information and correlations. This presentation discusses the MAUDE database and gives an example of the data-mining opportunities.

Bio: Professor Michael Pecht is a world renowned expert in strategic planning, design, test, and risk assessment of electronics and information systems. Prof Pecht has a BS in Physics, an MS in Electrical Engineering and an MS and PhD in Engineering Mechanics from the University of Wisconsin at Madison. He is a Professional Engineer, an IEEE Fellow, an ASME Fellow, an SAE Fellow. He is the editor-in-chief of IEEE Access, and served as chief editor of the IEEE Transactions on Reliability for nine years, and chief editor for Microelectronics Reliability for sixteen years. He has also served on three U.S. National Academy of Science studies, two US Congressional investigations in automotive safety, and as an expert to the U.S. Food and Drug Administration (FDA). He is the founder and Director of CALCE (Center for Advanced Life Cycle Engineering) at the University of Maryland, which is funded by over 150 of the world's leading companies at more than US$6M/year. The CALCE Center received the NSF Innovation Award in 2009 and the National Defense Industries Association Award. Prof Pecht is currently a Professor in Applied Mathematics, Statistics and Scientific Computation at the University of Maryland, as well as a Chair Professor in Mechanical Engineering. He has written over 500 technical articles and has 8 patents. In 2008, he was awarded the highest reliability honor, the IEEE Reliability Society’s Lifetime Achievement Award. In 2010, he received the IEEE Exceptional Technical Achievement Award for his innovations in the area of prognostics and systems health management.

I1: Invited Speaker 1

Chair: Lei Shu (Guangdong University of Petrochemical Technology, P.R. China)

Dalian High-tech Zone (DHTZ) is one of national first batch of state-level high-tech zones. In April 2016, DHTZ is honored as National Independent Innovation Pilot Area. The zone has strong software and information technology (IT) industry base- IT enterprises nearly 5000. It also boasts 110 of Top 500, more than 110 of industry leaders and nearly 200,000 IT talents. With software and information technology (IT) industry as foundations, DHTZ combines IT and Biotechnology (BT) and builds an innovative life science industry cluster. It has set up a Life Science Innovative Center, to build professional incubator and accelerator for science and technology enterprises and introduce overseas high-quality projects to the world. By establishing Clinical Cloud Diagnostic Center and Clinical Cloud Translational Medicine Treatment Center, we apply big data and cloud service to gene pool, humized tumor cell bank, antibody library, stem cell bank and so forth. To construct an innovative modern biomedical and healthcare industry model in a comprehensively way, we also explore new value with them on pharmaceutical companies, social research institutes, hospitals and Internet health practitioners aspects.

T1: Tea Break, Photograph

Chair: Jing Qin (Dalian University, P.R. China)

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Chair: Thomas Lindh (Royal Institute of Technology, Sweden)

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**L2: Lunch**

Chair: Jing Qin (Dalian University, P.R. China)

**K2: Keynote 2: Cyber Security Threats to Citizen's Health and Wellbeing**

Chair: Liming Luke Chen (De Montfort University, United Kingdom (Great Britain))

**Abstract:** The health and well-being of a nation's citizens is a critical function of any state. Amongst other sectors, healthcare is a Critical Infrastructure and recent attacks on health-care organisations in the UK, and indeed world-wide, have demonstrated the vulnerabilities of a sector that is increasingly reliant on the functioning of its information systems and electronically controlled infrastructures. In this talk I will analyse some of the risks and threats that the health-care sector is facing, in particular highlighting dependencies on other critical infrastructures whilst considering a number of relevant threat actors. Whilst research has progressed significantly our understanding of cyber security, the fast pace of technology adoption and the ubiquity of devices, sensors and communication links in emerging areas such as smart-care, e-health and assisted living, create new cyber security challenges that must be addressed. Many of these challenges have technological solutions but the real challenge is in the "wet-ware", the human component of these systems.

**Bio:** Professor Helge Janicke is the Director of De Montfort University's Cyber Technology Institute. He is the Head of School of Computer Science and Informatics. Prof. Janicke was awarded his PhD in Computer Science in 2007 and worked on Cyber Security with organisations such as Airbus Group, QinetiQ, Ministry of Defence and General Dynamics UK amongst others. His interests are covering formal verification techniques and their application to Cyber Security, SCADA and Industrial Control System Security as well as aspects of Cyber Warfare. He established DMU's Airbus Group Centre of Excellence in SCADA Cyber Security and Forensics Research in 2013. He is a general chair of the International Symposium on SCADA and Industrial Control Systems Cyber Security Research (ICS-CSR). He is Editor-in-Chief for the Journal of Security and Safety (EAI) and serves on the editorial board and as reviewer for a number of international journals.

**K3: Keynote 3: Integrated Network Application in Telemedical Assistant System**

Chair: Liming Luke Chen (De Montfort University, United Kingdom (Great Britain))

**Abstract:** The integration of telemedicine and information technology has become international medical research focus. We have launched research and application of the telemedical assistant system based on integrated network technology. We reviewed the current global research of link aggregation technology, unified carrier technology and telemedical assistant system and further issued the urgency and feasibility of the integration of innovative medical and information technology. We then discussed the key technologies of heterogeneous link aggregation based on self-similar model and business-oriented unified carrier for multi-network convergence in detail. In the aspect of link aggregation technology, we illustrated the dynamic cache management method and the design of link controller with self-similar model; in the aspect of unified carrier technology, we discussed the fast convergence technology, multi-service routing optimization technology and Linux-based unified carrier system. In summary, we manifested the trends and landscape of the integrated network technology application in the telemedical assistant system.

**Bio:** Professor Chengsheng Pan is long engaged in air ground integrated network management technology and aerospace information transmission network technology research. He has led and organized seven National "863" projects, one National "973" project of China. He has published over 100 papers in related conferences, journals, and books, and been authorized with 12 items of patents. He has been awarded two second prizes of National Scientific and Technological Progress, first prize of National Defense Science and Technology, first prize of Technology Invention in Liaoning Province, first prize of Scientific and Technological Progress, et al. He is the consultant of International Journal of Innovative Computing and Information & Control, serving as the part-time member of its Science and Technology Committee and standing director of the Chinese Society of Command and Control.

**T2: Tea Break**

Chair: Jing Qin (Dalian University, P.R. China)

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Chair: Carlos Juiz (Universitat de les Illes Balears, Spain)

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B: Banquet

Chair: Lei Shu (Guangdong University of Petrochemical Technology, P.R. China)

K4: Keynote 4: Role of mHealth in Universal Health Coverage (UHC)

Chair: Martin Cerny (VSB - Technical University of Ostrava, Czech Republic)

Abstract: The United Nations has recognised the need for a holistic approach of sustainable development where health, environment and social wellbeing are being targeted together through the new global Sustainable Development Goals (SDGs). In the healthcare sector Universal Health Coverage (UHC) is the platform that seeks to overcome inequality in tackling the service provision gap and financial gap that populations face. The role of ICT (Information and Communication Technologies) to build the essential building blocks of UHC has been accepted, In particular, the proliferation of mobile phones in developing countries, have raised the spectre of better access to quality healthcare in a cost-effective manner. Mobile communication devices, in conjunction with Internet and social media, present opportunities to enhance disease prevention and management by extending health interventions beyond the reach of traditional care—an approach referred to as mHealth. It has been predicted that by 2017 there will be “more mobile phones than people” on the planet, and currently three-quarters of the world’s population have access to a mobile phone. The World Health Organization (WHO) has announced that m-health has the “potential to transform the face of health service delivery across the globe”. Interestingly, the Govt of China has been actively encouraging universities to impart entrepreneurship education to its engineering and technical students. This requires inter-disciplinary approach to technical education and research. This talk will present an overview of the role entrepreneurship can play in helping address the global problem of Universal Health Coverage (UHC) based on mHealth.

Bio: Professor Pradeep Ray has recently been awarded the Shanghai 1000-talent Distinguished Professor status to work on the role of entrepreneurship in mHealth for addressing global problems. He is also a Professor in the Engineering Research Centre for Digital Medicine at Med-X Institute of Shanghai Jiao Tong University. He has been founder of the WHO Collaborating Centre on eHealth at the University of New South Wales (UNSW)-Australia where he is an Honorary Professor in the School of Public Health and Community Medicine (SPHCM). Pradeep led to completion (2006-2009) the WHO Research on the Assessment of eHealth for Health Care Delivery (eHCD) involving a number of countries in the Asia-Pacific region (India, China, Vietnam and Philippines). Pradeep also led to completion a number of international initiatives, such as the ITU-D/IEEE Mobile eHealth Initiative for Developing Countries (2004-2009) and the Global Longitudinal Study on the Assessment of mHealth (2009-2012). This study involved a number of developing countries, such as Bangladesh, India, PNG and Indonesia. The highly cited work by APuHC on mHealth Bangladesh led to the formation of the UNSW YunusSocial Business Hub for Health, the first of its kind in Australia. He has been an IEEE Distinguished Lecturer on eHealth (since 2014). He has been a founder and a Chair of IEEE eHealth Technical Committee (2009-2013) and the
K5: Keynote 5: Robust Surgical Endoscope Tracking and Navigation

Chair: Martin Cerny (VSB - Technical University of Ostrava, Czech Republic)

Abstract: Medical endoscopic procedures with a surgical tool called endoscope are widely performed in minimally invasive surgery (MIS). The endoscopes have been integrated with cameras at their distal tip and directly inserted into the body through natural orifices (e.g., mouth and nose) to observe the interior of hollow organs, e.g., sinusescopes for sinus inspection, coloscopes for colon/rectum cancer detection, angioscopes for examining the lumen of blood vessels, and bronchoscopes for lung and bronchus cancer diagnosis, staging, and treatment. Nowadays, navigated endoscopy is generally agreed to be the next generation of interventional or surgical endoscopy. It usually combines pre- and intra-operative imaging information to guide physicians during endoscopic procedures. However, endoscope three-dimensional motion tracking that spatially and temporally synchronizes various sensory information still remains challenging for developing different endoscopic navigation systems. In this respect, endoscope tracking and navigation aim at fusing the modality information to accurately and robustly locate or fly through the endoscope at any interest of regions. Unfortunately, fusing the multimodal information is still an open issue due to the information incompleteness, e.g., image artifacts, tissue deformation, and sensor output inaccuracy in computer assisted endoscopic interventions. In this talk, a novel framework of multimodal information fusion is presented to use evolutionary computing for endoscopic navigation systems. As most popular evolutionary computing algorithms, adaptive particle swarm optimizer and differential evolution are modified to precisely localize the endoscope and estimate the movement.

Bio: Professor Sean He, as a Chief Investigator, has received various research grants including four national Research Grants awarded by Australian Research Council (ARC). He is the Director of Computer Vision and Pattern Recognition Laboratory at the Global Big Data Technologies Centre (GBDTC). He is also the Director of UTS-NPU International Joint Laboratory on Digital Media and Intelligent Networks. He is an IEEE Senior Member and has been an IEEE Signal Processing Society Studentmember. He is a leading researcher in several research areas including big-learning based human behavioural recognition on a single image, image processing based on hexagonal structure, authorship identification of a document and a document’s components (e.g., sentences, sections etc.), network intrusion detection using computer vision techniques, car license plate recognition of high speed moving vehicles with changeable and complex background, and video tracking with motion blur. He has played various chair roles in many international conferences such as ACM MM, MMM, IEEE BigDataSE, IEEE CIT, IEEE AVSS, IEEE TrustCom, IEEE ICPR and IEEE ICARCV. In recent years, he has many high quality publications in IEEE Transactions journals such as IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, and IEEE Transactions on Multimedia; and in Elsevier's journals such as Pattern Recognition, Signal Processing, and Computer Networks. He has also had papers published in premier international conferences and workshops such as ACL, IJCAI, CVPR, ECCV and ACM MM. He has recently been a guest editor for various international journals such as Journal of Computer Networks and Computer Applications (Elsevier), Future Generation Computer Systems (Elsevier) and Signal Processing (Elsevier). He is currently an Advisor of HKIE Transactions.

T3: Tea Break

Chair: Jing Qin (Dalian University, P.R. China)

GP7: Artificial Intelligence and Machine Learning

Chair: Liming Luke Chen (De Montfort University, United Kingdom (Great Britain))

A Fault Diagnosis Method for Information Systems Based on Weighted Fault Diagnosis Tree 327
Liming Duan and Ruifeng Guo (Shenyang Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Fenhai Wang (Dalian Commodity Exchange, P.R. China); Rongli Gai (Dalian University, P.R. China)

Exploring Diseases Based Biomedical Document Clustering and Visualization Using Self-Organizing Maps 333
Setu Shah and Xiao Luo (IUPUI, USA)

A Supervised Machine Learning Study of Online Discussion Forums About Type-2 Diabetes 339
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Closed Loop Control of Blood Glucose Level with Neural Network Predictor for Diabetic Patients 346
Samuel Bamgbose (Prairie View A & M University, USA); Xiangfang Li and Lijun Qian (Prairie View A&M University, USA)

Using Predictive Classifiers to Prevent Infant Mortality in the Brazilian Northeast 352
Ronaldo Ramos (Instituto Federal de Educação Ciência e Tecnologia do Ceará, Brazil); Cristiano
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**Multivariate Time-Series Classification of Sleep Patterns Using a Hybrid Deep Learning Architecture 358**
Jeonghan Hong and Junho Yoon (Ulsan National Institute of Science and Technology, Korea)

**GP8: Image/Network/Communication and Video Processing on eHealth**

Chair: Christian Kohlschein (RWTH Aachen University, Germany)

**A Novel Benchmark on Human Activity Recognition Using WiFi Signals 364**
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**An Application of Vision Technology on Intelligent Sorting System by Delta Robot 376**
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**Transabdominal Fetal Pulse Oximetry: The Case of Fetal Signal Optimization 388**
Daniel Fong (University of California, Davis, USA); Andre Knoesen (UC Davis, USA); Soheil Ghasi (University of California, Davis, USA)

**Exploring Risk Factors and Predicting UPDRS Score Based on Parkinson's Speech Signals 394**
Jianxin Zhang, Weifeng Xu and Qiang Zhang (Dalian University, P.R. China); Bo Jin (Dalian University of Technology, P.R. China); Xiaopeng Wei (Dalian University, P.R. China)

**GP9: eHealth to Support Quality of Life**

Chair: Sarah Fallmann (De Montfort University, United Kingdom (Great Britain))

**Influence of Emotional Labor on Organizational Commitment in Government Logistics Personnel: The Mediating Effect of Job Burnout and the Moderating Effect of Perceived Organizational Support 400**
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L3: Lunch

Chair: Jing Qin (Dalian University, P.R. China)

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Chair: Ismini Psychoula (De Montfort University, United Kingdom (Great Britain))

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Chair: Zhengxing Huang (Zhejiang University, P.R. China)

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I2: Invited Speaker  : Application of innovative electrocardiogram soft ware on cardiac arrhythmias

I3: Invited Speaker 3 : The establishment of the quat strategy on tumor
cells + big data of tumor cells + the system of doctor decision + a personalized treatment

Cancer is a group of diseases associated with genetic mutations. Cancer diagnosis and treatment data come together to form big data, genome data are an important source of big cancer data. According to this idea, through liquid biopsy, such as the detection of the circulating tumor cells (CTCs) and genetic sequencing of CTCs tumor cells in blood, big data of tumor are accumulated, analysed and judged for tumor/cancer. So we are building the establishment of the quant strategy on tumor cells + big data of tumor cells + the system of doctor decision + a treatment. The developing of precision medicine in China and the building the database of Chinese cancer are through data collection, analysis, establishment of the doctor decision system, and carry out precision medical(individualized) treatment research. The big data of tumor cells and precision medicine are guided by government and operated by company.

T4: Tea Break

Chair: Jing Qin (Dalian University, P.R. China)

D: Dinner

Chair: Jing Qin (Dalian University, P.R. China)