2017 IEEE 19th International Conference on e-Health Networking, Applications and Services (Healthcom 2017)

Dalian, China
12-15 October 2017

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Program

Instruction for Speakers

The allocation of time:

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

W1S1-Workshop AI & TCM, Session 1: The 1st IEEE International Workshop on Artificial Intelligence in Chinese Medicine Workshop

Chair: Tong Yu (Information Institute of TCM, P.R. China)

Research on the Construction of Knowledge Service Platform for TCM Health Preservation
Tong Yu (Information Institute of TCM, P.R. China); Jinghua Li and Qi Yu (Institute of Information on TCM, China Academy of Chinese Medical Sciences, P.R. China); Ye Tian (China Academy of Chinese Medical Sciences, P.R. China); Zongyou Li, Yinghui Wang, Xiaofeng Sun and Lili Xu (Institute of Information on TCM, China Academy of Chinese Medical Sciences, P.R. China); Ling Zhu (China Academy of Chinese Medical Sciences, P.R. China)   **1**

A Preliminary Study on Syndrome Differentiation of Cold and Heat   7
Qinan Hu (Institute of Linguistics, Chinese Academy of Social Sciences, P.R. China); Tong Yu (Information Institute of TCM, P.R. China); Ling Zhu (China Academy of Chinese Medical Sciences, P.R. China); Jinghua Li and Qi Yu (Institute of Information on TCM, China Academy of Chinese Medical Sciences, P.R. China); Yueguo Gu (Institute of Linguistics, Chinese Academy of Social Sciences, P.R. China)

Intelligent Monitoring System Based on STM32   12
Xie Jing Wei (Dalian University Innovation and Entrepreneurship Institute, P.R. China)

Structural Technology Research on Symptom Data of Chinese Medicine   18
Aziguli Wulamu, Yuanyu Zhang, Xie Yonghong, Yang Xu and Yujia Chen (University of Science and Technology Beijing, P.R. China)

Construction of Knowledge Graph of Traditional Chinese Medicine Based on the Ontology   N/A
Xie Yonghong and Man Li (University of Science and Technology Beijing, P.R. China)

Traditional Chinese Medicine Prescription Mining Based on Abstract Text   26
Dan Xie (Wuhan, Hubei & Hubei University of Chinese Medicine, P.R. China); Wei Pei, Weiwei Zhu and Xiaodong Li (Wuhan, Hubei, P.R. China)

Ontology Constructing for Chinese Medicine Knowledge of Beng Lou   31
Ling Zhu (China Academy of Chinese Medical Sciences, P.R. China)

W2&W3-Workshop ETPHA & S&ReHIS: The 2nd IEEE International Workshop on Emerging Technologies for Pervasive Healthcare and Applications& The 4th International Workshop on Security and Reliability of eHealth Information Systems

Chair: Tareq Alhadidi (Prince Sattam bin Abdulazizi University & Biomedical Technology Dep., Saudi Arabia)

Advanced Block-Chain Architecture for e-Health Systems   37
Wei Liu (Georgia Gwinnett College, USA); Shi-sheng Zhu (Shantou University, Shantou Guangdong,

P.R. China); Thomas Mundie (GGC, USA); Udo R. Krieger (Otto-Friedrich-University Bamberg, Germany)

Systemic Design Approach to Reducing Rates of Unplanned Hospital Readmissions 43
Faisal Alkhaldi (Tennessee Tech University, USA); Ali Alouani (Tennessee Technological University, USA)

The Design of Wearable Sleep Apnea Monitoring Wrist Watch 50
Tingyu Sheng (Institute of Electronics, Chinese Academy of Sciences, P.R. China); Zhen Fang (Chinese Academy of Science, P.R. China); Xianxiang Chen (Institute of Electronics, Chinese Academy of Sciences, P.R. China); Zhan Zhao (The Institute of Electronics, Chinese Academy of Sciences, P.R. China); JunXia Li (Army General Hospital of PLA, P.R. China)

Feasibility Analysis for Deploying National Healthcare Information System (NHIS) for Pakistan 56
Tahreem Yaqoob (Military College of Signals - NUST, Pakistan); Faiza Mir (National University of Science and Technology, Pakistan); Haider Abbas (National University of Sciences & Technology, Pakistan); Waleed Shahid (National University of Sciences and Technology, Islamabad, Pakistan); Narmeen Shafqat (National University of Science and Technology, Pakistan); Muhammad Faisal Amjad (National University of Science and Technology (NUST) Islamabad, Pakistan)

A New Formula for Noninvasive Determination of Cardiac Output by Bioadmittance Signal Processing 62
Ridha Ben Salah (Prince Sattam Bin Abdulaziz University & College of Applied Medical Sciences, Saudi Arabia); Tareq Alhadidi (Prince Sattam bin Abdulazizi University & Biomedical Technology Dep., Saudi Arabia)

L1: Lunch

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

W1S2-Workshop AI & TCM, Session 2: The 1st IEEE International Workshop on Artificial Intelligence in Chinese Medicine Workshop

Chair: Tong Yu (Information Institute of TCM, P.R. China)

Reasoning Algorithm of Outdoors Tumble Based on E Sët for the Elderly 66
Jian Song and Bo Wang (China Academy of Art, P.R. China); Li Xu (Ningbo University of Technology, P.R. China); Mei Chen and Zhi Pan (Hangzhou Normal University, P.R. China)

Outline of the Construction and Application of a GFO-based TCM Diagnoses Ontology for Syndrome Differentiation of Psoriasis Vulgaris 72
Hai Long (Universität Leipzig & IMISE, Germany); Yan Zhu (Institute of Information on Traditional Chinese Medicine, China Academy of Chinese Medical Sciences, P.R. China); Junhui Wang (Guang'an men Hospital, China Academy of Chinese Medical Sciences, P.R. China); Lirong Jia (Institute of Information on Traditional Chinese Medicine China Academy of Chinese Medical Sciences, P.R. China); Heinrich Herre (Unversität Leipzig & IMISE, Germany)

Missing Value Imputation Methods for TCM Medical Data and Its Effect in the Classifier Accuracy 77
Dan Zeng (Hubei University of Chinese Medicine, P.R. China); Dan Xie (Wuhan, Hubei & Hubei University of Chinese Medicine, P.R. China); Ran Liu (Hubei University of Chinese Medicine, P.R. China); Xiaodong Li (China Academy of Traditional Chinese Medicine, P.R. China)

Review of Multi View Auto-stereoscopic Display System Based on Depth Image Analysis 81
Chao Wang, Siyuan Cheng, Changqing Ji, Jing Wang, Zumin Wang, Yan Liu and Yanhong Liu (Dalian University, P.R. China)

Research on Building of Acupuncture Domain Ontology 87
Guan Hua and Xie Dan (Hubei University of Chinese Medicine, P.R. China)

Interaction Between Virtual Scene Based on Kinect and Unity3D 91
Hou-ju Zhang (School of Information Science and Engineering, Dalian Polytechnic University, P.R. China); Ji-ping Li (School of Mathematics and Informatics, South China Agricultural University, P.R. China); Jian-jun Peng and Xiu-ying Shi (School of Information Science and Engineering, Dalian

Polytechnic University, P.R. China)

SP1-Post Session: Post for Demo,Poster,Short Papers

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

Simultaneous Learning of Speech Feature and Segment for Classification of Parkinson Disease   94
Yongming Li (Chongqing University & College of Communication Engineering, P.R. China); Cheng Zhang, Yunjian Jia and Pin Wang (Chongqing University, P.R. China)

Non-invasive Sleep Monitoring Based on RFID   100
Xiaoxuan Hu (Nanjing University of Post and Telecommunications, P.R. China); Kagome Naya (University of Aizu, Japan); Peng Li and Toshiaki Miyazaki (The University of Aizu, Japan); Kun Wang (Nanjing University of Posts and Telecommunications, P.R. China)

An e-Healthcare Sensor Network Load-balancing Scheme Using SDN-SFC   103
Ting-Mei Li (National Dong Hwa University, Taiwan); Hsin-Hung Cho (National Central University, Taiwan); Chen-Chi Liao (National Ilan University, Taiwan); Wei-Che Chien (National Chung Cheng University, Taiwan); Chin-Feng Lai and Han-Chieh Chao (National Ilan University, Taiwan)

Alert Me: Enhancing Active Lifestyle via Observing Sedentary Behavior Using Mobile Sensing Systems   107
Muhammad Fahim (Innopolis University, Russia); Thar Baker (Liverpool John Moores University, United Kingdom (Great Britain)); Asad Masood Khattak (Zayed University, United Arab Emirates); Omar Alfandi (University of Goettingen & Zayed University, Germany)

iSkin Specialist - Towards Care Everywhere   111
Akash Nambiar (Dougherty Valley High School, USA); Yuvraj Sethi (Phillips Exeter Academy, USA)

Transfer Bi-directional LSTM RNN for Named Entity Recognition in Chinese Electronic Medical Records   113
Xishuang Dong, Shanta Chowdhury and Lijun Qian (Prairie View A&M University, USA); Guan Yi (Harbin Institute of Technology, P.R. China); Jinfeng Yang (Harbin University of Science and Technology, P.R. China); Qiubin Yu (Second Affiliated Hospital of Harbin Medical University, P.R. China)

Improved Persuasive Design: Matching Personal Traits and Inducing Effortful Thinking   117
Hong Jiang, Yue Qi and Yiwen Chen (CAS Key Laboratory of Behavioral Science, Institute of Psychology, P.R. China)

Metrics for Assessing Blockchain-based Healthcare Decentralized Apps   121
Peng Zhang, Michael A Walker, Jules White and Doug Schmidt (Vanderbilt University, USA); Gunther Lenz (Varian Medical Systems, USA)

A Method for Classifying Medical Images Using Transfer Learning: A Pilot Study on Histopathology of Breast Cancer   125
Jongwon Chang and Jisang Yu (Yonsei University College of Engineering, Korea); Taehwa Han (Yonsei University Health System, Korea); Hyuk-jae Chang and Eunjeong Park (Yonsei University College of Medicine, Korea)

CAir: Mobile-Health Intervention for COPD Patients   129
Thomas Brunschwiler, Rahel Straessle and Bruno Michel (IBM Research - Zurich, Switzerland); Theodore van Kessel (IBM Watson Research, USA); Bong Jun Ko (IBM T.J. Watson Research Center, USA); David A. Wood (IBM Research, USA); Yves Nordmann and Ulrich Muehlner (E-Medicus, Switzerland)

LSTM-RNNs Combined with Scene Information for Human Activity Recognition   132
Wen-Hui Chen (National Taipei University of Technology, Taiwan)

Visit smart medical and health application: Go to Affiliated Zhongshan Hospital, Dalian University

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 gleam 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, humanized 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)

GP1: Health Monitoring, Traffic Characterization & Management

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

An Effective Approach for Epileptic Seizures Detection from Multi-Sensors Integrated in an Armband   138
Mostafa Gheryani (University of Paris Descarte, France); Osman Salem and Ahmed Mehaoua (University of Paris Descartes, France)

A Data-Driven Approach to Pre-Operative Evaluation of Lung Cancer Patients **144**
Oleksiy Budilovsky (University of California, Davis, USA); Golnaz Alipour, Andre Knoesen and Lisa Brown (UC Davis, USA); Soheil Ghiasi (University of California, Davis, USA)

Technical Note - Corrigendum to "c-Fos Immunoreactivity and Variation of Neuronal Units in Rat's Motor Cortex After Chronic Implants **150**
Marco Freire (University of Rio Grande do Norte, Brazil); Jean Faber (Federal University of São Paulo, Brazil); Jose Ronaldo Santos (Federal University of Sergipe, Brazil); Nelson Lemos (State University of Maringa, Brazil); Maria Aratanha, Pedro Cavalcanti and Edgard Morya (Santos Dumont Institute, Brazil)

GP2: Healthcare Information Systems

Chair: Hsi-Pin Ma (National Tsing Hua University, Taiwan)

Assessment of Healthcare Claims Rejection Risk Using Machine Learning **152**
Prasad Saripalli (Edifecs Inc. & Adjunct Faculty Univerity of Washington, USA); Anundhara Chimmad and Venu Tirumala (Edifecs, USA)

ICU Mortality Prediction Using Modified Cost-Sensitive PCA and Chaos PSO **158**
Jiankang Liu (Yanshan University, P.R. China); Xianxiang Chen (Institute of Electronics, Chinese Academy of Sciences, P.R. China); Zhen Fang (Chinese Academy of Science, P.R. China); Kai Tong and Lipeng Fang (Yanshan University, P.R. China); JunXia Li (Army General Hospital of PLA, P.R. China)

Beyond Best Effort: Automated Feedback for Improved Data Quality in Clinical Disease Registries. A Case Study of the International Niemann-Pick Disease Registry (INPDR) **164**
Stephan Glöckner (Helmholtz Centre for Infection Research, Germany & University of Melbourne, Australia); Salla Toikkanen (National Institute for Health and Welfare (THL), Finland & Helmholtz Centre for Infection Research, Germany); Jiankun Rui, William Hu and Richard Sinnott (University of Melbourne, Australia)

A Machine Learning Based System for the Automatic Evaluation of Aphasia Speech **170**
Christian Kohlschein (RWTH Aachen University, Germany); Maximilian Schmitt (University of Passau, Germany); Björn W Schuller (Imperial College London & University of Passau, United Kingdom (Great Britain)); Sabina Jeschke (RWTH Aachen University & Institute Cluster IMA/ZLW & IfU, Germany); Cornelius Werner (University Hospital RWTH Aachen, Germany)

LSTM Based Classification Model and Its Application for Doctor - Patient Relationship Evaluation **176**
Hongrui Kuang, Chao Che, Qiang Zhang and Xiaopeng Wei (Dalian University, P.R. China)

GP3: Security and Privacy on eHealth

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

Anonymizing Approach to Resist Label-Neighborhood Attacks in Dynamic Releases of Social Networks **181**
Xiaoyi Hu, Li-e Wang, Jiaqi Tang, Cong Lei, Peng Liu and Xianxian Li (Guangxi Normal University, P.R. China)

Finger ECG-based Authentication for Healthcare Data Security Using Artificial Neural Network **187**
Ying Chen (The University of Aizu, Japan); Wenxi Chen (University of Aizu, Japan)

Privacy and Security for Patient-centric Elderly Health Care **193**
Vangalur Alagar (Concordia University, Canada); Kasi Periyasamy (University of Wisconsin-La Crosse, USA); Kaiyu Wan (Xi'an Jiaotong-Liverpool University, P.R. China)

Security Analysis of a mHealth App in Android: Problems and Solutions **199**
Isabel de la Torre and Bruno Olivar (University of Valladolid, Spain); Joel J. P. C. Rodrigues (National Institute of Telecommunications (Inatel), Brazil & Instituto de Telecomunicações, Portugal); Miguel López-Coronado (University of Valladolid, Spain)

Ting Chen (Chang'an University, P.R. China); Yun Xiao (Northwest University Xi'an China, P.R. China); Xiangmo Zhao, Tao Gao and Zhigang XU (Chang'an University, P.R. China)

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)

GP4: Intelligence information/data processing

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

GP5: IoT Application and Wearable Sensor Systems

Chair: Minkeun Ha (KTH Royal Institute of Technology, Sweden)

An Ensemble Approach to Activity Recognition Based on Binary Sensor Readings **288**
   Wen-Hui Chen (National Taipei University of Technology, Taiwan)

GP6: Network/Communication Infrastructures and Architectures for Healthcare

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

Standardization of IT Governance in Healthcare Institutions **293**
   Carlos Juiz (Universitat de les Illes Balears, Spain); Beatriz Gomez (University of the Balearic Islands, Spain); Magdalene Rosenmöller (IESE Business School, Spain)

Deadline-constrained Data Aggregation Scheduling in Urban Vehicular Networks **299**
   Cheng Feng and Weipeng Jing (Northeast Forestry University, P.R. China)

CC-Fog: Toward Content-Centric Fog Networks for E-Health **304**
   Daphne Guibert (INSA Lyon, France); Jun Wu (Shanghai Jiao Tong University, P.R. China); Shan He (ShangHai JiaoTong University, P.R. China); Meng Wang (Shanghai Jiaotong University, P.R. China); Jianhua Li (Shanghai Jiao Tong University, P.R. China)

Clustered Multi-dictionary Code Compression Method for Portable Medical Electronic Systems **309**
   Ji Tu (China Academy of Electronics and Information Technology，P.R.China); Xiangyi Yu, Yangyang Li, Liu Yuan and Meng Li (China Academy of Electronics and Information Technology, P.R. China); Weiwei Fang (Beijing Jiaotong University, P.R. China)

TinySense: Multi-User Respiration Detection Using Wi-Fi CSI Signals **315**
   Guo Bin (Northwestern Polytechnical University, P.R. China)

Classification of ECG Signals Based on 1D Convolution Neural Network **321**
   Dan Li, Jianxin Zhang, Qiang Zhang and Xiaopeng Wei (Dalian University, P.R. China)

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 e-Health 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

founder of IEEE Healthcom (since 1999).

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., sinuscopes for sinus inspection, colonscopes 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 behavious 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); Fenghai 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**
Jonathan-Raphael Reichert (Copenhagen Business School & Vertic, Denmark); Klaus Langholz Kristensen (Copenhagen Business School & William Demant Holding, Denmark); Raghava Rao Mukkamala and Ravi Vatrapu (Copenhagen Business School, Denmark)

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

Silva (Federal Institute of Science and Technology of Ceará (IFCE), Brazil); Mário W. L. Moreira (University of Beira Interior, Portugal); Joel J. P. C. Rodrigues (National Institute of Telecommunications (Inatel), Brazil & Instituto de Telecomunicações, Portugal); Antonio Oliveira (Federal Institute of Ceara, Brazil); Luiz Odorico Andrade (UFC, Brazil)

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***
Linlin Guo, Lei Wang, Jialin Liu, Wei Zhou, Bingxian Lu, Tao Liu and Guangxu Li (Dalian University of Technology, P.R. China); Chen Li (School of Software, Dalian University of Technology, P.R. China)

A Research on CSI-based Human Motion Detection in Complex Scenarios ***370***
Jialin Liu, Lei Wang, Linlin Guo, Jian Fang, Bingxian Lu and Wei Zhou (Dalian University of Technology, P.R. China)

An Application of Vision Technology on Intelligent Sorting System by Delta Robot ***376***
Shiyu Wang (University of Chinese Academy of Sciences & Shenyang Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Hu Lin (Graduate School of The Chinese Academy of Science, Beijing, P.R. China); Rongli Gai (Dalian University, P.R. China); Yilan Sun (Shenyang Golding NC & Intelligence Tech Co., Ltd Chinese Academy of Sciences, P.R. China)

ViLiP - A Visual Literature Research Platform for Biomedical Publications ***382***
Christian Kohlschein, Daniel Klischies and Malte Modlich (RWTH Aachen University, Germany); Sabina Jeschke (RWTH Aachen University & Institute Cluster IMA/ZLW & IfU, Germany); Markus Kipp (Ludwig Maximilian University of Munich, Germany)

Transabdominal Fetal Pulse Oximetry: The Case of Fetal Signal Optimization ***388***
Daniel Fong (University of California, Davis, USA); Andre Knoesen (UC Davis, USA); Soheil Ghiasi (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***
Xin Wang (CAS Key Laboratory of Behavioral Science, Institute of Psychology & University of Chinese Academy of Sciences, P.R. China); Tong Liu and Yiwen Chen (CAS Key Laboratory of Behavioral Science, Institute of Psychology, P.R. China)

Home-based Exercise System for Patients Using IoT Enabled Smart Speaker ***406***
Jayneel Vora (Nirma University, India); Sudeep Tanwar (Institute of Technology Nirma University Ahmedabad Gujarat, India); Sudhanshu Tyagi (Thapar University, Patiala, India); Neeraj Kumar (Thapar University Patiala, India); Joel J. P. C. Rodrigues (National Institute of Telecommunications (Inatel), Brazil & Instituto de Telecomunicações, Portugal)

FAAL: Fog Computing-based Patient Monitoring System for Ambient Assisted Living ***412***
Jayneel Vora (Nirma University, India); Sudeep Tanwar (Institute of Technology Nirma University Ahmedabad Gujarat, India); Sudhanshu Tyagi (Thapar University, Patiala, India); Neeraj Kumar (Thapar University Patiala, India); Joel J. P. C. Rodrigues (National Institute of Telecommunications (Inatel), Brazil & Instituto de Telecomunicações, Portugal)

Helping the Elderly with Physical Exercise: Development of Persuasive Mobile Intervention Sensitive to Elderly Cognitive Decline   418
> Mohammed Alsaqer (King Khalid University, Saudi Arabia); Samir Chatterjee (Claremont Graduate University, USA)

AutiAid: A Learning Mobile Application for Autistic Children   424
> Raafat Aburukba, Fadi Aloul, Anam Mahmoud, Kamil Kamili and Suad Ajmal (American University of Sharjah, United Arab Emirates)

L3: Lunch

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

GP10: Pervasive and Ubiquitous Computing on eHealth

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

Un-Apriori: a Novel Association Rule Mining Algorithm for Unstructured EMRs   430
> Bo Song (Qingdao University of Science & Technology, P.R. China); Yunxia Feng (Qingdao University of Science & Technology & Hangzhou Dianzi University, P.R. China); Xu Li, Zhen Sun and Yanli Yang (Qingdao University of Science & Technology, P.R. China)

Design and Implementation of a Mobile-health Call System Based on Scalable kNN Query   436
> Yang Gao, Zumin Wang and Changqing Ji (Dalian University, P.R. China); Peng Xiao (Dalian Maritime University & Dalian Polytechnic University, P.R. China); Jing Qin and Zeyu Li (Dalian University, P.R. China)

A New Classification Algorithm WKS Based on Weight   442
> Zhang Min (DaLian University, P.R. China); Qi Min (DaLianUniversity, P.R. China); Sun Kang (DaLian University, P.R. China); Niu Yujun (School of Information Engineering, Dalian University, P.R. China); LongXiang Shi (Tamkang University, P.R. China)

Cuff-less Blood Pressure Estimation Using Kalman Filter on Android Platform   446
> Zhengling He (University of Chinese Academy of Sciences, P.R. China); Xianxiang Chen (Institute of Electronics, Chinese Academy of Sciences, P.R. China); Zhen Fang (Chinese Academy of Science, P.R. China); Minfang Tang (University of Chinese Academy of Sciences, P.R. China); JunXia Li (Army General Hospital of PLA, P.R. China); Shanhong Xia (Institute of Electronics, CAS, P.R. China)

Research on SCKM Algorithm Based on the Parallel Clustering   451
> Zhang Min (DaLian University, P.R. China); Zang ZhaoJie (Dalian University, P.R. China); Niu Yujun (School of Information Engineering, Dalian University, P.R. China); LongXiang Shi (Tamkang University, P.R. China)

GP11: Sustainable eHealth Service and Applications

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

Socio-technical Approach to Engineer Gigabit App Performance for PhysicalTherapy-as-a-Service   455
> Ronny Bazan Antequera, Prasad Calyam and Dmitrii Chemodanov (University of Missouri-Columbia, USA); Walter de Donato (University of Napoli Federico II, Italy); Anup Mishra (University of Missouri-Columbia, USA); Antonio Pescapé (University of Napoli Federico II, Italy); Marjorie Skubic (University of Missouri, USA)

Remote Patient Health Monitoring Cloud Brokering Services   462
> Raafat Aburukba, Assim Sagahyroon and Mohammed Elnawawy (American University of Sharjah, United Arab Emirates)

Subjective Liver Ultrasound Video Quality Assessment of Internet Based Videophone Services for Real-Time Telesonography   468
  Ramkrishna Bharath (Indian Institute of Technology, India); P Rajalakshmi (Indian Institute of Technology Hyderabad, India); Uday B Desai (IIT Hyderabad, India)

Health Service Provision Based on Typed Resources of Data, Information and Knowledge   474
  Lixu Shao, Yucong Duan, Donghai Zhu, Jingbing Li and Hui Zhou (Hainan University, P.R. China); Qi Qi (Hainan University)

Internet of the Body and Cognitive Companion   480
  Rahel Straessle, Yuksel Temiz and Sebastian Gerke (IBM Research - Zurich, Switzerland); Jonas Weiss (IBM Research GmbH, Zurich Research Laboratory, Switzerland); Arvind Sridhar (IBM Research - Zurich, Switzerland); Stephan Paredes (IBM Research Zurich, Switzerland); Thomas Brunschwiler, Emanuel Loertscher, Neil Ebejer and Bruno Michel (IBM Research - Zurich, Switzerland); Theodore van Kessel, Ismael Faro, Sufi Zafar and Frank Libsch (IBM Watson Research, USA); Marc Taubenblatt (IBM T.J. Watson Research Center, USA); Keiji Matsumoto (IBM-Japan, Japan)

A Novel System Architecture for Brain Controlled IoT Enabled Environments   486
  Jagadish. B (IITH, India); M. P. R. S. Kiran and P Rajalakshmi (Indian Institute of Technology Hyderabad, India)

GP12: Body Sensor and Sensor Network

Chair: Rick van Veen (Philips Research, United Kingdom (Great Britain))

User Behavior Driven MAC Scheduling for Body Sensor Networks   491
  Mao Van Ngo (Singapore University of Technology and Design & Institute for Infocomm Research (I2R), A*STAR, Singapore); Quang Duy La (Singapore University of Technology and Design, Singapore); Derek Leong (Institute for Infocomm Research, Singapore); Tony Q. S. Quek (Singapore University of Technology and Design, Singapore)

Anti-synchronization of Coupled Boolean Networks   497
  Niu Yujun (School of Information Engineering, Dalian University, P.R. China); Zhang Min (DaLian University, P.R. China); Jing Qin and Cui Xin (Dalian University, P.R. China)

Analyzing Chronological Order Reconstruction Problem in Cyber-Physical Systems   503
  An Guo (Shenyang Institute of Computing Technology, P.R. China); Dong Yu (Chinese Academy of Sciences, P.R. China); Rongli Gai (Dalian University, P.R. China); Yi Hu (Chinese Academy of Sciences, P.R. China)

Gram Staining of Intestinal Flora Classification Based on Convolutional Neural Network   509
  Xiaomin Xu (Hexi University, P.R. China); Jing Qin (Dalian University, P.R. China); Junxiong Guo (Hexi University, P.R. China)

A Post-processing Beam Hardening Correction Method for Axial Computed Tomography   514
  Guowei Xue (Shenhen Institute of Information Technology, P.R. China); Xiuwang Li (CTO, P.R. China); Zhiliang Xu (Shenhen Institute of Information Technology, P.R. China)

A Multi-layer Low-Energy Adaptive Clustering Hierarchy for Wireless Sensor Network   519
  Sadia Din (Kyungpook National University, Korea); Anand Paul (Kyungpook National University & Hanyang University, Korea); Syed Hassan Ahmed (University of Central Florida, USA); Awais Ahmad (Yeungnam University, Korea); Gwanggil Jeon (Incheon National University, Korea)

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

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 gentic 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 quat 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)