



Special Issue on Selected Technologies and Applications in Wireless Communications for Smart City Computing

Zheng Xu¹ · Yunhuai Liu² · Xinrong Li³

Published online: 26 July 2018
© Springer Science+Business Media, LLC, part of Springer Nature 2018

Developing smart city is the key to the next generation urbanization process for improving the efficiency, reliability, and security of a traditional city. The concept of smart city includes various aspects such as environmental sustainability, social sustainability, regional competitiveness, natural resources management, cybersecurity, and quality of life improvement. With the massive deployment of networked smart devices/sensors, unprecedentedly large amount of sensory data can be collected and processed by advanced computing paradigms which are the enabling techniques for smart city. For example, given historical environmental, population and economic information, salient modeling and analytics are needed to simulate the impact of potential city planning strategies, which will be critical for intelligent decision making. Analytics are also indispensable for discovering the underlying structure from retrieved data in order to design the optimal policies for real time automatic control in the cyberphysical smart city system. Furthermore, uncertainties and security concerns in the data collected from heterogeneous resources aggravate the problem, which makes smart city planning, operation, monitoring and control highly challenging. The submitted manuscripts were reviewed by experts from both academia and industry. After two rounds of reviewing, the highest quality manuscripts were accepted for this special issue. Totally, 15 papers are accepted. This special issue will be published by International Journal of Wireless Information Networks as special issues.

The paper “Structural Modeling and Performance Analysis of Rotary Circuit in Directional Drilling Rig Based on Load Sensing Technology” by Wang, to verify the validity

of the mathematical model and the simulation analysis, an experimental platform of the load sensing hydraulic system was built. The paper “Research and Improvement of Wireless Sensor Network Secure Data Aggregation Protocol Based on SMART” by Wang and Chen, present a new dynamic slicing D-SMART algorithm which based on the importance degree of data. The proposed algorithm can decrease the communication overhead and energy consumption effectively while provide good performance in preserving privacy by the reasonable slicing based on the importance degree of the collected raw data. The paper “Deadband Scheduling in Sensor Node and Controller Node for Wireless Networked Control Systems” by Tang et al., use the deviations and their variation rate to build another deadband. Simulation results indicate that the proposed deadband scheduling method significantly achieves dynamic performance in WNCS, while effectively reducing network delays and network data packet traffic. The paper “The Research of User’s Behavioural Decision on Intelligent Home Control and Sensing System” by Xie and Xu, presents a decision method for user’s behaviours which based on the C4.5 algorithm, selecting samples from data collected by intelligent home system, analysing and processing samples to generate a decision tree. The paper “Chaos Synchronization of Complex Network Based on Signal Superposition of Single Variable” by Li et al., Lorenz system is taken for example to demonstrate the effectiveness of the presented method for a complex network of arbitrary topological type, and the dynamics analysis of the Lorenz chaotic system is given.

The paper “Conformance Test of AUTOSAR Network Management” by Luo and Xie, focuses on designing an approach for the conformance test of AUTOSAR network management (NM). After analyzing the state machine of the NM module, a new approach based on the virtual network simulation is proposed according to the characters of the NM module. The paper “A Distributed Management Method Based on the Artificial Fish-Swarm Model in Cloud Computing Environment” by Luo, presents an artificial fish

✉ Zheng Xu
juven_xz@163.com

¹ Shanghai University, Shanghai, China

² Peking University, Beijing, China

³ University of North Texas, Denton, USA

to achieve mutual cooperation of nodes in the distributed management method. The paper “Iterative Learning Control for Network Data Dropout in Nonlinear System” by Su et al., presents iterative learning control for data dropout in nonlinear system. The parallel distribution compensation method is used to determine the T–S nonlinear model and the nonlinear model is converted into local linear model. The paper “Flow Field Simulation and Experimental Study of Friction Aided Jet-Electro-Deposition Based on the Wireless Information Networks” by Huang et al., developed a simulate model of the flow field to simulate the velocity of the electroplating solution and investigate the influence of flow field on electro-deposition at different electrode gaps. The paper “Power Line Communication with Network Transmission Data Loss Based on Learning Control” by Su et al., proposed power line communication with transmission data. An iterative learning control method for the power line communication is studied by P-type learning control law.

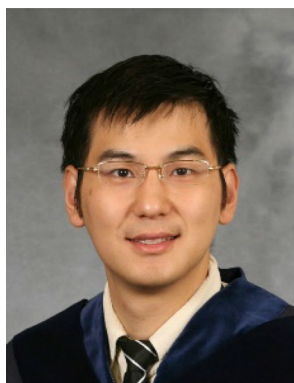
The paper “An Improved LEACH Routing Algorithm for Wireless Sensor Network” by Huang et al., proposes a new energy efficient routing algorithm (NF-LEACH). In the new algorithm, There are many factors have considered to prolong the network life cycle that they are the degree of membership, residual energy, base station distance and data transmission mode. The paper “Intermittent Fault Diagnosability of Hyper Petersen Network” by Jiang and Liang, investigate the intermittent fault diagnosability of hyper Petersen networks. The paper “An Compression Technology for Effective Data on Cloud Platform” by Zhu and Zhou, in order to preserve them and make fun use of the storage space, those effective data must be compressed and those compressed data, if necessary, should be recovered correctly. The paper “A Safe Proactive Routing Protocol SDDSV for Ad Hoc Network” by Ye et al., based on the traditional proactive routing protocol for Ad Hoc network, an improved safe routing strategy SDDSV is put forward to resist attacks against routing protocols. The paper “A Review on Key Technologies of the Distributed Integrated Modular Avionics System” by Wang et al., review the Key Technologies of the Distributed Integrated Modular Avionics System.

We would like to thank all reviewers who have helped in the papers review process, and the authors for their contribution and efforts to complete the papers with a very high quality. Finally, we express our gratitude to Dr. Kaveh Pahlavan for initiating this special issue and inviting us to undertake this rewarding activity.



Zheng Xu received Diploma and Ph.D. from the School of Computing Engineering and Science, Shanghai University, Shanghai, in 2007 and 2012, respectively. From 2014 to 2016, he work as the postdoctor in Tsinghua University. He is currently the Associate Professor in Shanghai University. Before he joined Shanghai University, he works in the Third Research Institute of Ministry of Public Security. He has authored or co-authored more than 70 publications with over 1400 citations (H-index 21)

including IEEE Trans. on Fuzzy Systems, IEEE Trans. on Automation Science and Engineering, IEEE Trans. on Cloud Computing, IEEE Trans. on Emerging Topics in Computing, IEEE Trans. on Systems, Man, and Cybernetics: Systems, IEEE Trans. on Big Data, IEEE Trans. on Industrial Informatics, etc.



Yunhuai Liu is currently an associate professor in the Big Data Research Center at Peking University. He received his B.E. degree in Computer Science and Technology from Tsinghua University, Beijing in 2000, and Ph.D. degree in Computer Science and Engineering from Hong Kong University of Science and Technology in 2008. From 2008 to 2010 he worked in Hong Kong University of Science and Technology as a research assistant professor. In the year 2010, he joined Shenzhen Institutes of

Advanced Technology, Chinese Academy of Sciences as an associate professor. From 2011 to 2016, he was with the Third Research Institute of Ministry of Public Security, China. Dr. Liu is the author and co-author of over 80 papers in premier network and system journals and conferences with over 2000 citations (H-index 24). Dr. Liu is the recipient of the NSFC Outstanding Youth Foundation (2013). He serves as the TPC member of IEEE Mobile Ad hoc Networks and IEEE SUTC, and reviewer for many international conferences such as ACM SIGCOMM, ACM Mobicom, IEEE INFOCOM, IEEE Percom, IEEE ICDCS, and international journals such as IEEE Transactions on Networks (TON), IEEE Transactions on Parallel and Distributed Systems (TPDS), ACM Transactions on Sensor Networks (TOSN), and etc. His research papers have been published in many prestigious conferences and journals such as ACM Mobicom, IEEE INFOCOM, IEEE ICDCS, IEEE ICPADS, and IEEE TPDS, IEEE Transactions on Mobile Computing (TMC). The paper titled “Opportunity-based topology control in wireless sensor networks” obtained the only Best Paper Award in ICDCS 2008 (1 out of 638). He is an ACM and IEEE member.



Xinrong Li received the B.E. degree from the University of Science and Technology of China, Hefei, China, in 1995, the M.E. degree from the National University of Singapore in 1999, and the Ph.D. degree from the Worcester Polytechnic Institute (WPI), Worcester, Mass, USA, in 2003, all in electrical engineering. From 2003 to 2004, he served as a Postdoctoral Research Fellow at the Center for Wireless Information Network Studies, WPI. He joined the Department of Electrical

Engineering, University of North Texas, Denton, Tex, USA, as an Assistant Professor in 2004, and then, he became an Associate

Professor in 2010. His recent research has been focused on statistical signal processing theory and its applications in wireless and sensor network systems. He is also interested in the development of wireless sensor network systems for practical applications.