

Smart City: Key Technologies and Practices

► Jianhua Ma



Jianhua Ma is a professor in the Faculty of Computer and Information Sciences, Hosei University, Japan. From 1983 to 2002 he researched wireless communications, data encryption, speech processing, multimedia QoS, graphics ASIC, e-learning, CSCW, multi-agents, Internet AV, mobile service, and P2P networking. Since 2003 he has been devoted to what he calls "smart world/hyperworld" with pervasive smart physical u-things or i-things and characterized by ubiquitous intelligence and UbiSafe guarantee. His current research interests include ubiquitous computing, social computing, context-aware service, Internet of Things, wearable technology, digital human clones, and cybermatics. He has published more than 200 papers, authored and/or edited more than 15 books, and has been a guest editor for more than 20 journal special issues. He was the founder and co-chair of the 1st International Conference on Cyber Worlds (CW'02) and was the advisory chair of the 1st IEEE International Conference on Social Computing (SocialCom'09). He has been a founder of the IEEE conferences on Ubiquitous Intelligence and Computing (UIC); Autonomic and Trusted Computing (ATC); Cyber, Physical and Social Computing (CPSCom); Internet of Things (iThings); Smart World Congress (SWC); Cyber Science and Technology Congress (CyberSciTech); and IEEE CIS Task Force on Smart World.

► Weifeng Lv



Weifeng Lv is a professor in the School of Computer Science and Engineering, Beihang University, China. He is also the deputy director of the State Key Laboratory of Software Development Environment, China. His research interests and publications span from wireless sensor networks and big data mining and application to large-scale software development methods and smart city. During his career of more than 20 years, he has authored more than 100 academic papers and a university textbook in the field of computer science. He has supervised more than 30 PhD and Master's degree students and won three National Science and Technology Progress Awards. He is now the leader of the "Smart Cities (Phase II)" project jointly supported by the National High Technology Research and Development Program of China and the National Technical Committee on Science and Technology Infrastructure of Standardization Administration of China.

Ubiquitous sensors, devices, networks, and information are paving the way to smart cities in which computation and intelligence are pervasive. This enables reliable, relevant information and services to be accessible to all people. Smart objects, homes, hospitals, manufacturing, and systems will eventually be present in every city.

Although smart city is one of the hottest fields due to its great potential to make our cities more efficient, it is still necessary to clarify the fundamental infrastructures, platforms, and practices needed for truly smart cities. This special issue is dedicated to key technologies and representative practices for building smart cities. Original papers were solicited from smart-city experts, and six papers were selected for inclusion in this special issue. Each paper covers a different aspect of smart city research and practice.

The first paper, "Barcelona Smart City: The Heaven on Earth" by S. Madakam and R. Ramaswamy, covers both a comprehensive review on smart city and a detailed smart city example. Based on extensive data collection and analysis, the authors review smart city origin, concept, research, and applications. The paper describes a representative of smart practice: Barcelona Smart City. The systematic review enables readers to have a clear image about the history and development of smart city. The Barcelona smart city project is also a good reference for other cities in carrying out their smart cities projects.

The second paper, "Smart Cities in Europe and the ALMA Logistics Project" by D. El Baz and J. Bourgeois, first surveys smart city projects in Europe to show the extent of smart transport and logistics, and then describes a smart city project related to a logistic mobile application called ALMA. The application is based on Internet of Things and combines a communication infrastructure and high-performance computing infrastructure in order to deliver high-quality mobile logistic services and that can adapt to dynamic logistics operations.

The third paper, "Smart City: On Urban Operational Collaboration" by R. Gao and W. Kou, expounds the historic origin of urban operational coordination problem that is essential to almost all cities, and then identifies related major challenges and opportunities to make a city smarter. Furthermore, the authors describe the IBM Intelligent Operation Center (IOC) that is a general smart city system framework as an overall solution covering various aspects in implementations of a smart city. Finally, the paper shows a detailed case study using the IOC in building an Emergency Management Centre in Rio de Janeiro, Brazil.

The fourth paper, "A Novel Data Schema Integration Framework for the Human-Centric Services in Smart City" by D. Xia, D. Cui, J. Wang and Y. Wang, is focused on the effective scheme to integrate data from various sources and with different characteristics in a city. The authors propose a novel human-centric framework for data schema integration using both schema metadata and instance data for schema matching based on human intervention similarity entropy criteria to balance precision and efficiency. An experiment with real-world dataset has been conducted to

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test and evaluate the proposed data schema integration.

The fifth paper, “Top-Level Design of Smart City Based on ‘Integration of Four Plans’” by J. Cheng and P. Sun, presents a top-level design methodology for smart cities based on the “Integration of Four Plans” covering strategic management, spatial construction, economic development and technical support. The paper also discusses optimal resource allocation; co-ordination of the development of urban economy, society, resources, environment, and people’s livelihoods; and maps out the blueprints for healthy and sustainable development of a smart city. A case study using the proposed methodology for a smart city top-level design is provided.

The sixth paper, “Smart City Development in China: One City One Policy” by B. Wan, R. Ma, W. Zhou and G. Zhang, is

focused on the high level policy and development in managing and promoting many smart cities from government’s view point. The basic policy is advocated as “One City One Policy” because cities differ greatly. Of ninety cities as first batch of pilot smart cities announced by the Ministry of Housing and Urban-Rural Development (MOHURD), this paper introduces five successful pilot cities (including town and district) as five different models in China’s smart city development.

We would like to express our great appreciations to all the authors for their contributions and all the reviewers, in particular, Professor Junde Song, for their efforts in helping to improve the quality of the papers. We are grateful to the editorial office of *ZTE Communications* for their strong support in bringing this special issue to press.

News

Congratulations to the Newly Elected IEEE Fellows

Every year, the IEEE inducts about one-tenth of one percent of the total voting IEEE membership as IEEE Fellows in recognition of their distinguished accomplishments in any of the IEEE fields of interest. This year, four more members of the ZTE Communications Editorial Board became IEEE Fellows for 2016.



Professor Chengzhong Xu, Wayne State University, USA, was named Fellow for leadership in resource management for parallel and distributed systems.



Dr. Fa-Long Luo, Element CXI, Inc., USA, was named Fellow for contributions to adaptive signal processing for hearing and multimedia applications.



Professor Jinhong Yuan, University of New South Wales, Australia, was named Fellow for contributions to multi-antenna wireless communication technologies.



Professor Shigang Chen, University of Florida, USA, was named Fellow for contributions to quality of service provisioning and policy-based security management in computer networks.

The ZTE Communications Editorial Office congratulates them for their achievements and wishes them further success in the future.