

Communications and Networking for Smart Grid Systems

Webcast Type:

Tutorial

[2011 IEEE Global Communications Conference](#)

Webcast URL:

javascript:openWin('https://dl.comsoc.org/comsocdl/DRM-authentication.action?path=LoginUser&tutorialid=918410','500','700','Shopping Cart')

Status:

Free for Members

Duration:

201minutes

Presentation Date:

Mon, 12/05/2011

Free to Members Date:

Wed, 12/05/2012

Abstract:

In this tutorial, an intensive (but friendly) introduction to the various data communications and networking technologies being developed for smart grid will be provided. First, a brief overview of smart grid, enabling technologies for smart grid, and the importance and requirements of data communication for reliable and efficient operation of smart grid will be presented. The details of data communication and networking infrastructure (e.g., home area network, wide-area measurement system, home energy management system, advanced metering infrastructure, demand response management, and sensor and actuator network), and the related standardization activities will then be discussed. The impact of cyber threat and security related issues (e.g., security requirements and security services including confidentiality, integrity, authentication, authorization, and third-party protection) will be reviewed. To this end, several major open research issues and directions for future research on smart grid communications and networking will be outlined.

Bio:

Dusit Niyato is currently an Assistant Professor in the Division of Computer Communications, School of Computer Engineering, Nanyang Technological University, Singapore. His current research interests include design, analysis, and optimization of wireless communication and

vehicular networks for ITS applications, smart grid systems, and green radio communications. He is co-author of the books Dynamic Spectrum Access and Management in Cognitive Radio Networks (Cambridge University Press, 2009) and Game Theory in Wireless and Communication Networks: Theory, Models, and Applications (Cambridge University Press, 2009, ISBN: 978-0-521-89847-8). He has published more than 80 papers in leading Journal and Conferences related to protocol design and radio resource management in mobile communication systems. Dr. Niyato serves as an Editor for the IEEE Transactions on Wireless Communications, Wireless Communications and Mobile Computing (WCMC) Journal, and Journal of Communications and Networks (JCN). He served as a co-chair for the Next Generation Mobile Networks Symposium held in conjunction with International Wireless Communications and Mobile Computing Conference (IWCMC) in 2009 and 2010.

Rose Qingyang Hu received her BS degree from the University of Science and Technology of China, her MS degree from Polytechnic University, Brooklyn, NY, and her Ph.D. degree from the University of Kansas. During 1998-2000, she worked for Nortel Networks, where she has been leading Nortel broadband multimedia satellite performance evaluation and 1xRTT CDMA Wireless Priority Service system design and evaluation. During 2000-2001, she worked for Yotta Networks as a senior systems engineer, leading the system design and performance evaluation for optical switch scheduling, reliability and QoS. From January 2002 to June 2004, she had been with Electrical and Computer Engineering Department of Mississippi State University as an Assistant Professor. She had advised graduate students on their research and taught advanced level courses on wireless networks and performance analysis during that period. From 2006 to 2009 she was a technical manager with Nortel wireless standards and architecture team, leading Nortel 4G wireless technology performance evaluation and standards development. Between April 2009 and December 2010, she had been a Senior Researcher at RIM, and a Senior Wireless Platform Architect for Intel before she joined the faculty of Utah State University recently. Currently she is an Associate Professor in the Department of Electrical and Computer Engineering at Utah State University.

Dr. Hu is serving on the editorial board for Security and Communication Networks Journal. She is a guest editor for IEEE Communications Magazine special issue on Recent Progress in Machine to Machine Communications, a guest editor for IEEE Wireless Communications Magazine special issue on HetNets, and a guest editor for IEEE Network Magazine special issue on Communication Infrastructures for Smart Grid. Her current research interests include in next generation wireless communications and networks, smart grid communications, network modeling and performance analysis, and network security. She has been published extensively in all the above research areas. Dr. Hu is a Senior Member of IEEE and a member of Phi Kappa Phi and Epsilon Pi Epsilon Honor Societies.

Ekram Hossain is currently a Full Professor in the Department of Electrical and Computer Engineering at University of Manitoba, Winnipeg, Canada (<http://www.ee.umanitoba.ca/~ekram>). His current research interests include resource allocation and medium access control in wireless networks, cooperative and cognitive wireless systems, smart grid systems, and green radio communications. He is an author/editor of the books Smart Grid Communications and Networking (Cambridge University Press, 2012), Cooperative Cellular Wireless Networks (Cambridge University Press, 2011, ISBN: 978-0-521-76712-5), Dynamic Spectrum Access and Management in Cognitive Radio Networks (Cambridge University Press, 2009, ISBN: 978-0-521-

89847-8), Cognitive Wireless Communication Networks (Springer, 2007, ISBN: 978-0-387-68830-5), Wireless Mesh Networks: Architectures and Protocols (Springer, 2007, ISBN: 978-0-387-68839-8), Introduction to Network Simulator NS2 (Springer, 2008, ISBN: 978-0-387-71759-3), Heterogeneous Wireless Access networks (Springer, 2008, ISBN: 978-0-387-09776-3). Dr. Hossain serves as an Area Editor for the IEEE Transactions on Wireless Communications, an Editor for the IEEE Transactions on Mobile Computing, the IEEE Communications Surveys and Tutorials, and IEEE Wireless Communications. Dr. Hossain is a registered Professional Engineer (P.Eng.) in the province of Manitoba, Canada.

Yi Qian received a Ph.D. degree in electrical engineering from Clemson University. Currently he is an assistant professor in the Department of Computer and Electronics Engineering, University of Nebraska- Lincoln, located at the Peter Kiewit Institute in Omaha, Nebraska. His research interests include information assurance and network security, network management, network design, network modeling, simulation and performance analysis for next generation wireless networks, wireless sensor networks, broadband satellite networks, optical networks, high-speed networks and the Internet. His previous professional experience included serving as a senior member of scientific staff and a technical advisor at Nortel Networks, an assistant professor at University of Puerto Rico at Mayaguez, and a senior research member at the National Institute of Standards and Technology - a major US federal government agency. He has a successful track record to lead research teams and to publish research results in leading scientific journals and conferences. Several of his recent journal articles on wireless network design and wireless network security are among the most accessed papers in the IEEE Digital Library.

He has been on numerous conference technical committees including serving as the Symposium Co-Chair of IEEE GLOBECOM 2011 - Symposium on Communications and Information Security, the Tutorial Co-Chair and the Workshop Co-Chair of International Teletraffic Congress 2011, the Symposium Co-Chair of IEEE SmartGridComm 2010 - Symposium on Regulatory Issues and Their Impact on Communications Aspects, the Symposium Co-Chairs of IEEE ICC 2010 and 2009 - Symposium on Wireless Communications, the Tutorial Chair of DRCN 2009, the Panel Chair of IWSSC 2009, the Track Chair of IEEE VTC 2008-Spring - Mobile/Wireless Applications and Services Track, the Track Chair of MILCOM 2007 - Wireless and Sensor Networks Track, the General Chair of ISWPC 2007, the Finance Chair of ISWPC 2007, the Technical Program Co-Chairs of Workshop on Information Assurance 2007 and 2006, and the Symposium Co-Chair of IEEE GLOBECOM 2006 - Symposium on Wireless Communications and Networking. He is an associate editor for IEEE Transactions on Circuits and Systems for Video Technology. He is also serving on the editorial boards for Security and Communication Networks, Wireless Communications and Mobile Computing, and International Journal of Communication Systems. He has been served as a guest editor for several special issues for IEEE Communications Magazines, IEEE Wireless Communications Magazine, and IEEE Network Magazine, including recently, as a guest editor for IEEE Network Magazine special issue on Communication Infrastructures for Smart Grid. Dr. Yi Qian is a member of ACM and a senior member of IEEE.

Authors:

Niyato, Dusit
Hu, Rose Qingyang
Hossain, Ekram
Qian, Yi

Source URL: <http://www.comsoc.org/webcasts/view/communications-and-networking-smart-grid-systems>