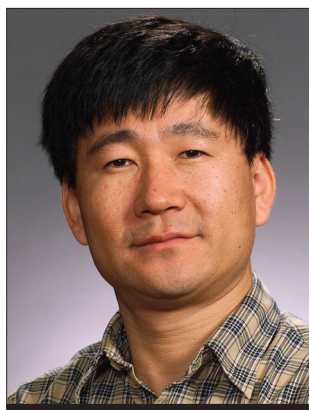


# GREEN COMMUNICATIONS: DESIGN THE SMART ENVIRONMENT WITHOUT HARMING OURSELVES

**D**eep integrations of modern communications, computing, and control have already revolutionized the way we are living today, with better quality of life, and reshaped our society. At the same time, they have also generated many social, economic, and environmental problems, which may harm our living environment. One of the notable problems is the energy consumption, which has already caused major concerns on global warming and public health. How to find innovative ways to save energy consumption in our communications systems, computing facilities, and control mechanisms is obviously of great interest. Green communications is one of the efforts made along this line. The challenge is how to identify the important problems and find innovative solutions.



YUGUANG MICHAEL FANG

I once attended a seminar on cloud computing, and the speaker talked about how to schedule tasks based on work load or computing tasks to minimize energy consumption. I asked whether they had considered turning off part of the air conditioning system to save energy, a possibility of energy saving with larger magnitude compared to task-scheduling-based energy saving strategies. The answer was no for their work, but others had addressed the issue separately. A couple of years ago, when I visited Dr. Zhisheng Niu at Tsinghua University in China (one of the guest editors and an author for this Special Issue), we talked about the proper ways to do green communications. Both of us agreed that we should start with the identification of the major energy consuming entities in communications systems. One of my favorite examples I usually use for green

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## MESSAGE FROM THE EDITOR-IN-CHIEF

communications is how to adjust the (part of) air conditioning systems at base stations for more effective energy saving. It is commonly observed that a little change in energy-hungry entities such as air conditioning systems may outweigh all energy saving in data transmissions! Thus, it seems we need holistic design in green communications.

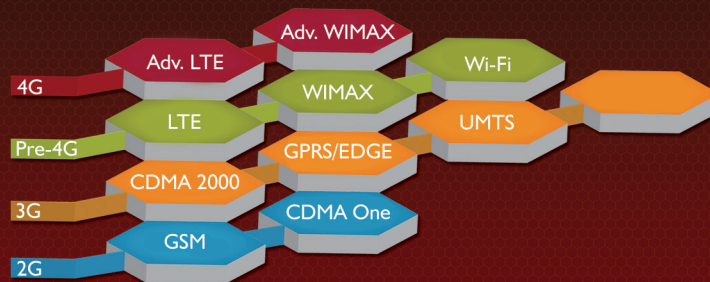
This Special Issue is dedicated to addressing green communications with the hope that innovative design approaches and new solutions toward effective design for green communications can be identified. It contains eight articles selected from 40 submissions and two articles from the open call, all addressing green communications. I must thank our guest editors, Drs. Peter Han Joo Chong, Cyril Leung, Zhisheng Niu, Tapani Ristaniemi, and Boon-Chong Seet, for their tremendous effort in putting this issue in front of you. I hope you enjoy reading these articles and help design a smart living environment without harming ourselves!

### BIOGRAPHY

YUGUANG "MICHAEL" FANG [F'08] (fang@ece.ufl.edu) received a Ph.D. degree in systems engineering from Case Western Reserve University in January 1994 and a Ph.D. degree in electrical engineering from Boston University in May 1997. He was an assistant professor in the Department of Electrical and Computer Engineering at New Jersey Institute of Technology

from July 1998 to May 2000. He then joined the Department of Electrical and Computer Engineering at the University of Florida in May 2000 as an assistant professor, got an early promotion to an associate professor with tenure in August 2003, and to a full professor in August 2005. He held a University of Florida Research Foundation (UFRF) Professorship from 2006 to 2009, and holds a Changjiang Scholar Chair Professorship with Xidian University, Xi'an, China, from 2008 to 2011 and a Guest Chair Professorship with Tsinghua University, China, from 2009 to 2012. He has published over 300 papers in refereed professional journals and conferences. Dr. Fang received the National Science Foundation Faculty Early Career Award in 2001 and the Office of Naval Research Young Investigator Award in 2002, and is the recipient of the Best Paper Award in IEEE International Conference on Network Protocols (ICNP) in 2006 and the recipient of the IEEE TCGN Best Paper Award in the IEEE High-Speed Networks Symposium, IEEE Globecom in 2002. He has also received a 2010-2011 UF Doctoral Dissertation Advisor/Mentoring Award and the 2009 UF College of Engineering Faculty Mentoring Award. He is also active in professional activities. He is a member of ACM. He is currently serving as Editor-in-Chief for *IEEE Wireless Communications* (2009–present) and serves/has served on several editorial boards of technical journals, including *IEEE Transactions on Mobile Computing* (2003–2008, 2011–present), *IEEE Transactions on Communications* (2000–present), *IEEE Transactions on Wireless Communications* (2002–2009), *IEEE Journal on Selected Areas in Communications* (1999–2001), *IEEE Wireless Communications* (2003–2009), and *ACM Wireless Networks* (2001–present). He served on the Steering Committee for *IEEE Transactions on Mobile Computing* (2008–2010). He has been actively participating in professional conference organizations, including serving as Technical Program Co-Chair for IEEE INFOCOM '14, Steering Committee Co-Chair for QShine (2004–2008), Technical Program Vice-Chair for IEEE INFOCOM '05, Technical Program Area Chair for IEEE INFOCOM (2009–2012), Technical Program Symposium Co-Chair for IEEE GLOBECOM '04, and a member of the Technical Program Committee for IEEE INFOCOM (1998, 2000, 2003–2008).

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