Green communications and computing networks [Series Editorial]

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University of Chile
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The concept of green information and communications technologies (ICT) is relevant to both environmental sustainability and ICT. Green ICT is an interdisciplinary field relevant to a number of areas and topics, such as information systems, computer science and technologies, communications and networking, power and energy systems, electronics, environmental and civil engineering, industrial engineering and project management, social sciences, and so on. The green ICT could be considered a coined-term from two highly overlapped terms, green communications [1] and green computing [2]. Basically, two mainstream ideas may be addressed in green ICT, i.e., greening ICT and ICT for green objectives. Even if the field of green ICT has been receiving more and more attentions in research communities as well as industrial, governmental, and international organizations [1–5], more and more technical investigations and applications are still expected due to the relevant long term concerns and challenges. In early 2015, the IEEE Technical Committee on Green Communications and Computing (TCGCC), IEEE Research Project on Vision for Green ICT Standardizations, and IEEE Technical SubCommittee on Big Data (TSCBD) jointly initialized the efforts of the first IEEE International Workshop on Green Standardization and Industry Issues for ICT and Relevant Technologies (GSIICT), which will be held in conjunction with the 2015 IEEE Global Communications Conference (Globecom 2015), and the motivation of the efforts is to promote more relevant activities, especially standardization, towards green objectives in industry. Surely, the IEEE Series on Green Communications and Computing Networks can expect more submissions on the relevant industry issues and standardization activities in the future.

The fourth, November 2015, issue of IEEE Series on Green Communications and Computing Networks includes 6 articles addressing different topics relevant to green ICT.


The article “On Balancing Energy Efficiency for Network Operators and Mobile Users in Dynamic Planning,” written by Muhammad Ismail, Mohamed Kashef, et al., proposed an energy-aware dynamic planning scheme by taking both downlink and uplink energy consumptions into account, and elaborated the design issues for mobile terminal association and base station operation along with their trade-offs.

The article “Post-Peak ICT: Graceful Degradation for Communication Networks in an Energy Constrained Future,” written by Sofie Lambert, Margot Deruyck, et al., explored the interdependency of temporally varying power supply when renewable and intermittent energies provide major energy shares in the future ICT networks, and presented an introduction and discussion on the relevant problem for different ICT network sections and a case study for a wireless access network.

The article “A Survey on Green Scheduling Schemes for Homogeneous and Heterogeneous Cellular Networks,” written by Ting Yang, Fabien Heliot, and Chuan Foh, provided a recent survey on green scheduling schemes for heterogeneous cellular networks and a performance analysis on some of the existing schemes.

The article “Assessing the Energy Consumption of Mobile Applications,” written by Chien Chan, Wenwen Li, et al., presented the energy consumption evaluation of smartphone applications in a real LTE (Long Term Evolution) network, provided a methodology for analyzing and processing large volumes of data from wireless networks, and studied the energy trade-offs between data and signaling traffic energy consumption, highlighting the effects of signaling on the network overall.

The article “Towards Green Data Center as an Interruptible Load for Grid Stabilization in Singapore,” written...
by Wenfeng Xia, Yonggang Wen, et al., addressed an interruptible load of data center caused from renewable energy and distributed generation, and proposed real-time power analytics framework embedded software as sensors (ESaS), which monitor resource usage, in order to stabilize power grids.

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REFERENCES


BIOGRAPHIES

JINSONG WU [SM] (wujs@ieee.org) is associate professor in Department of Electrical Engineering, Universidad de Chile, Santiago, Chile. He is the founder and founding Chair of the IEEE Technical Committee on Green Communications and Computing (TCGCC). He is an Editor of IEEE Journal on Selected Areas in Communications (JSAC) Series on Green Communications and Networking. He was the leading Editor and co-author of the comprehensive book Green Communications: Theoretical Fundamentals, Algorithms, and Applications (CRC Press, 2012).

JOHN THOMPSON [SM] (john.thompson@ed.ac.uk) currently holds a personal chair in Signal Processing and Communications at the School of Engineering in the University of Edinburgh, UK. He was deputy academic coordinator for the recent Mobile Virtual Centre of Excellence Green Radio project and now leads the UK SERAN project which studies spectrum issues for 5G wireless. He also currently leads the European Marie Curie Training Network ADVANTAGE which trains 13 PhD students in the area of Smart Grid Technology. He is also a distinguished lecturer on green topics for ComSoc in 2014-2015.

HONGGANG ZHANG [SM] (honggangzhang@zju.edu.cn) is a Full Professor with the Zhejiang University, China. He was the International Chair Professor of Excellence for Université Européenne de Bretagne (UEB) and Supélec, France (2012-2014). He served as the Chair of the Technical Committee on Cognitive Networks (TCCN) in ComSoc during 2011-2012. He was the Lead Guest Editor of IEEE Communications Magazine Feature Topic Issues on “Green Communications”. He has served as the General Co-Chair of 2010 IEEE GreenCom and the Co-Chair of IEEE Online GreenComm 2015. He is the book co-editor/co-author of “Green Communications: Theoretical Fundamentals, Algorithms and Applications” (CRC Press).

DANIEL C. KILPER [SM] (dkilper@optics.arizona.edu) is with University of Arizona. He served as the founding Technical Committee Chair of GreenTouch Consortium, and was the Bell Labs Liaison Executive for the Center for Energy Efficient Telecommunications at the University of Melbourne, Australia. While at Bell Labs, he received the President’s Gold Medal Award in 2004 and was a member of the President’s Advisory Council on Research. He has served as the General Co-Chair of IEEE Online Green Communications Conference 2014 and 2015.