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Springer Mobile Network & Applications (MONET)

Special Issue on

Networking in 5G Mobile Communications Systems: Key Technologies and Challenges

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Overview

With the challenge of 1000 times wireless traffic volume increasing in 2020 as compared to the 2010 level, fundamental research on the next generation mobile communication networks, or in a general term as 5G networks, is highly demanded in next 5 to 10 years. 5G networks are not the simple upgrade of its predecessor, by adding additional spectrum and thus boosting the capacity, or replaced with advanced radio technology. It needs fundamental rethinking from system and architecture level down to the physical layer, and to answer the question of how to provision data-intensive services in very dense area with guaranteed quality of service (QoS) and affordable energy consumption by sustainable systems.

In 5G networks, one prominent feature is the prevalence of small cell for high capacity and energy efficient way of service provision. The old cell concept is disrupted and replaced by multiple-layer heterogeneous cell concept, evolving from with border to borderless. The new system architecture, control plane, interference coordination techniques, multi-branch and multi-site antenna transmission are heavily required. To deal with the ever-increasing complexity in radio access as well as mobile core networks, self-organizing networks and cognitive radio networks will find their key roles in 5G networks.

To meet the above challenges, 5G networks require a mix of new technologies to boost the designs on networking, e.g., small cell deployment, dense network, massive MIMO, heterogeneous wireless networks, and etc. We expect to explore these key technologies along with the prospects and challenges of future 5G networking. This Special Issue solicits both original research and tutorial articles that discuss about the networking aspect of 5G mobile communications systems, and propose new network architectures and protocols to improve the network throughput and energy efficiency, as well as guarantee the quality of experience (QOE) of subscribers.

Topics

Topics of interest include, but are not limited to:

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<th>Networking architectures and protocols used for 5G networks</th>
<th>Spectrum sharing and cognitive radio techniques for 5G networks</th>
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<td>Wide scale small cell deployment</td>
<td>Massive MIMO power control for dense small cell networks</td>
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<td>Capacity and scaling laws for dense networks</td>
<td>Dense spatial reuse technology for millimeter wave transmission</td>
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<td>Wireless backhaul solutions and control plane for small dense networks</td>
<td>Energy and spectral efficiency for 5G networks</td>
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<td>5G dynamic radio interface design for small and dynamic cells</td>
<td>Cooperative communication schemes for 5G networks, e.g. coordination multi-point transmission (COMP)</td>
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<td>Software defined network (SDN) approaches for mobile core networks</td>
<td>Multiple access technologies for 5G networks</td>
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Important Dates
- Manuscript Submission: May 30, 2014
- Acceptance Notification: September 30, 2014
- Final Manuscript Due: November 30, 2014
- Publication Date: February 2015

Submission Procedure
Authors should follow the MONET Journal manuscript format at the journal site:
http://www.springer.com/engineering/signals/journal/11036. Manuscripts should be submitted online through
http://www.editorialmanager.com/mone/. A copy of the manuscript should also be emailed to the following email:
gexiaohu@gmail.com. The “Subject field” of the email must contain “MONET 5G Networking Paper - “.

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Short Bios
Xiaohu Ge (M'09-SM'11) is currently a Professor with the Department of Electronics and Information Engineering at Huazhong University of Science and Technology (HUST), China. He received his PhD degree in Communication and Information Engineering from HUST in 2003. He has worked at HUST since Nov. 2005. Prior to that, he worked as an assistant researcher at AjouUniversity (Korean) and Politecnico Di Torino (Italy) from Jan. 2004 to Oct. 2005. He was a visiting researcher at Heriot-WattUniversity, Edinburgh, UK from June to August 2010. His research interests are in the area of mobile communications, traffic modeling in wireless networks, green communications, and interference modeling in wireless communications. He has published about 80 papers in refereed journals and conference proceedings and has been granted about 15 patents in China. He is leading several projects funded by NSFC, China MOST, and industries. He is taking part in several international joint projects, such as the RCUK funded UK-China Science Bridges: R&D on (B)4G Wireless Mobile Communications and the EU FP7 funded project: Security, Services, Networking and Performance of Next Generation IP-based Multimedia Wireless Networks.
Dr. Ge is currently serving as an Editor for Wireless Communications and Mobile Computing Journal (John Wiley & Sons), International Journal of Communication Systems (John Wiley & Sons), IET Networks and KSII Transactions on Internet and Information Systems, the guest editor of IEEE Communications Magazine on 5G SI. Since 2005, he has been actively involved in the organisation of more than 10 international conferences, such as Executive Chair of IEEE GreenCom 2013 and Co-Chair of workshop of Green Communication of Cellular Networks at IEEE GreenCom 2010. He is a Senior Member of the IEEE, a Senior member of the Chinese Institute of Electronics, a Senior member of the China Institute of Communications, and a member of the NSFC and China MOST Peer Review College.

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Bo Rong received the B.S. degree from Shandong University in 1993, the M.S. degree from Beijing University of Aeronautics and Astronautics in 1997, and the Ph.D. degree from Beijing University of Posts and Telecommunications in 2001. He is currently a Research Scientist with Communications Research Centre Canada, Ottawa, ON. He is also an Adjunct Professor at Ecole de technologie superieure (ETS), Universite du Quebec, Canada. Dr. Rong has authored or coauthored over 70 technical papers in major journals and conferences, as well as two book chapters in the areas of wireless networking & communications. Many of these publications have theoretical and practical significance to the research community and industry. For example, his work “Call Admission Control Optimization in WiMAX Networks”, was ranked #1 most accessed paper in August 2008 among all papers published in IEEE Transactions on Vehicular Technology, and #69 among all IEEE papers. Dr. Rong’s research interests include modeling, simulation, and performance analysis of next-generation wireless networks. He is a member of IEEE Communications Society and IEEE Broadcasting Society. He serves as an Associate Editor for IEEE COMMUNICATIONS LETTERS as well as the Guest Editor of special issues for IEEE COMMUNICATIONS MAGAZINE and IEEE WIRELESS COMMUNICATIONS MAGAZINE.