

## IMPORTANT MILESTONES

Dear readers,  
Time flies! The holiday season comes again. It is time for us to prepare for the annual celebration of Christmas and the New Year. Therefore, I would like to take this wonderful opportunity to send my warmest greetings to all of you. In particular, I would like to send my best wishes to all Editorial Board members, who have worked extremely hard to handle the reviews of submissions for this magazine. My greetings should also go to the publications staff of IEEE Communications Society for their great help to the magazine in publishing papers in a timely manner.

As a tradition of this magazine, the end of the year is also the time for us to take a look back at what we have done for this magazine as well as what we have achieved in the year that is ending. We can learn a



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lot from what we have experienced in the past year. Undoubtedly, one of the most significant achievements we have achieved in 2014 is that *IEEE Wireless Communications* has been ranked as the number one publication in terms of its impact factor in the following three important publication categories (Source: Journal Citation Reports®, issued by ISI Web of Knowledge<sup>SM</sup> in 2014 July):

- 1.Engineering, Electrical & Electronic (247 publications);
- 2.Telecommunications (78 publications); and
- 3.Computer Science, Hardware & Architecture (50 publications).

The impact factor of *IEEE Wireless Communications* is 6.524, making it the publication with the highest impact factor ever achieved in IEEE Communications Society publication history. We are very proud of

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this achievement. At the same time we feel that this has also created a new challenge for us to see if we can maintain this or push it to an even higher level. To achieve this goal, we need to work even harder. One thing we can do at the moment is to find a way to further shorten the average turn-around time for this magazine. Currently, based on the data shown in ScholarOne Manuscript Central for this magazine (collected for the period from November 17, 2013 to November 17, 2014), the average turn-around time for this magazine is 62.26 days vs. 74.8 days, as shown in my report written for the ICC 2014 ComSoc Publications Council meeting. It is nice to note that it has been improved a bit over the same data shown half a year ago, but it still has room for improvement. A short submission-to-publication cycle is extremely important for all people who want to publish or read the state-of-the-art research works published in this magazine. We will continue to urge all our Editorial Board members to work harder to achieve this goal.

I would like to take this opportunity to also share with you some more statistics about this magazine at this moment. Based on the data as shown in ScholarOne Manuscript Central of this magazine for the same period (i.e., from November 17, 2013 to November 17, 2014), the average acceptance ratio for this magazine is 25.5 percent (vs. 23.1 percent in the last report given at ICC 2014), and the total number of submissions (including original and revised manuscripts) is 502 (vs. 474 as given in the ICC 2014 report).

Another important milestone for this magazine in 2014 is that this magazine has successfully passed the Periodicals Review and Advisory Committee (PRAC) carried out by the IEEE TAB Periodicals Committee in November 2014. PRAC usually takes place for every IEEE publication once every five years, and this year is the time for the PRAC of this magazine. The PRAC should examine the performance of an IEEE publication in the past five years according to a well designed set of performance metrics, and this is the basis for IEEE to evaluate the performance of this particular publication. In the process of the PRAC, we were requested to fill out a large number of forms to provide the IEEE with all information needed about this magazine before the PRAC interview. The interview of the PRAC for this magazine took place in New Brunswick, New Jersey on November 21, 2014. The overall rating for this magazine was very positive due to its excellent performance in the last five years. I would like to take this opportunity to express my thanks to ComSoc Vice-President of Publications Sarah Kate Wilson, ComSoc Director of Magazines Steve Gorshe, as well as Joseph Milizzo and Charis Scoggins for their great support and help in the entire process of the PRAC for this magazine. They spent a great amount of time on this important event, and made it a great success.

In this issue, as a tradition, there are two sections. The first section hosts a Feature Topic (FT) on Mobile Converged Networks guest edited by Honglin Hu, Yun Rui, Riku Jäntti, and Kari Pehkonen. Due to the large number of submissions, the Guest Editors of this FT worked very hard as a team to handle the reviews of all submissions for

this FT in a timely manner. Fourteen articles survived the review process and are included in this issue. They represent state-of-the-art works contributed from both industry and academia on this important subject, which will be one of the most important features of future 5G mobile networks. I would like to thank all the Guest Editors for their great effort in editing this FT and bringing us these excellent articles. I hope that all of our readers will enjoy reading the material in this issue's FT.

In addition to the FT papers, the second part of this issue consists of five Open Call papers.

The first article included in this section is "Key Elements to Enable Millimeter Wave Communications for 5G Wireless Systems," written by Lili Wei *et al.* This article conducts a comprehensive survey on millimeter wave communication technologies for future 5G wireless systems. Several key elements to enable mmWave communications in 5G have been identified in this article, which include (i) channel characteristics regarding mmWave signal attenuation due to free space propagation, atmospheric gases, and rain; (ii) hybrid (digital plus analog) beamforming architecture in mmWave systems; (iii) the blockage effect in mmWave communications due to penetration loss; (iv) application of mmWave transmission with narrow beams in non-orthogonal device-to-device communications; (v) mmWave transmission in phantom cells of heterogeneous networks with control/user traffic split infrastructure; and (vi) mmWave transmission for small cell backhaul.

The second Open Call article is "IEEE 802.11ah: The Wi-Fi Approach for M2M Communications," co-authored by T. Adame *et al.* In this article, the authors address various important issues on machine-to-machine (M2M) communications, which will be one of the most popular technologies for 5G wireless communications. In particular, in this article the authors aim to give a comprehensive review of the works done in the IEEE 802.11ah Task Group (TGah), which is working to propose a new standard to address the particular requirements for M2M networks characterized by a large number of power-constrained terminals, a relatively large transmission range, small and infrequent data messages, and low data rates with short delay. The article focuses on discussion of several key features of this new standard, especially those related to ways to reduce energy consumption in the MAC layer. Therefore, this article is a useful reference for those working in M2M communications.

The third Open Call article included in this issue is "Securing Emerging Short Range Wireless Communications: The State of the Art," contributed by Kui Ren *et al.* In this article, the authors make an effort to discuss the issues on near field communication (NFC) technologies, which have been found many applications in today's short-range wireless communications, particularly in smart phones. It is pointed out that NFC is undergoing rapid expansion with many promising features including low power, small size, and peer-to-peer communications without needing complex network configuration. On the other hand, as suggested by the authors, the current NFC technology has the limitation that almost all NFC-enabled applications require built-in NFC chipsets. In addition,

from a security perspective the confidentiality issue of transmitted data from all of today's NFC devices has not been fully addressed. In this article, the authors propose an alternative NFC technology with an emphasis on barcode- and acoustics-based NFC, which are fully compatible with legacy devices and existing infrastructure to provide a high level of security guarantee. This is indeed an interesting work, and I do believe it can be useful to the people working in this area.

Future 5G wireless communications will use several newly emerging physical-layer cooperative communication techniques to provide high spectral efficiency, such as physical-layer network coding (PNC), interference alignment, and virtual multiple-input multiple-output (VMIMO). The implementation of these physical-layer techniques needs support from appropriate upper-layer mechanisms. The fourth article, "MAC-Centric Cross-Layer Collaboration: A Case Study on Physical-Layer Network Coding," aims to address the aforementioned issues, and was written by Qingyang Song *et al.* In particular, this article takes PNC as an example to showcase how the upper layers can support PNC in multihop networks. They also present a medium access control (MAC)-centric cross-layer collaboration scheme for PNC to schedule different relaying methods adaptively and allocate needed resources (transmission powers, channels, etc.) efficiently.

The last article in the Open Call section, authored by Shanzhi Chen *et al.*, is "The Development of TD-SCDMA 3G to TD-LTE-Advanced 4G From 1998 To 2013." It is a review article reporting the works done by China Academy of Telecommunication Technology (CATT) in the process of developing TD-SCDMA and TD-LTE-Advanced, which are 3G and 4G standards proposed by China, respectively. TD-LTE, as an evolutionary version from TD-SCDMA, is accepted by many mobile operators and manufactures, and

will become one of the most important global standards in the world. In this article, the authors offer a review of the standardization and system development history from TD-SCDMA 3G to TD-LTE-Advanced 4G from 1998 to 2013. Based on the successful deployment of TD-LTE systems in China, it is expected that TD-LTE-Advanced will be one of the most popular 4G mobile communication technologies in China as well as in the world. Therefore, we expect that the publication of this article will definitely help our readers know more about the progress in 4G standard development in China, which is the fastest growing economy in the world today.

Before the end of this Editor's Note, I should not forget to wish all readers a Merry Christmas and, more important, health and happiness in the coming year!

### BIOGRAPHIES

HSIAO-HWA CHEN [S'89, M'91, SM'00, F'10] (hshwchen@ieee.org) is currently a Distinguished Professor in the Department of Engineering Science, National Cheng Kung University, Taiwan. He obtained his Ph.D. degree in telecommunication engineering from the University of Oulu, Finland, in 1991. From 2001 to 2003, he served as founding director of the Institute of Communications Engineering of National Sun Yat-Sen University, Taiwan, which was the first telecommunication research institute established in Southern Taiwan. This institute has graduated a large number of telecommunication postgraduate degree holders for Taiwan. He has authored or co-authored over 300 technical papers in major international journals and conferences, six books, and more than 10 book chapters in the areas of telecommunications, including the books *Next Generation Wireless Systems and Networks* and *The Next Generation CDMA Technologies* (Wiley, 2005 and 2007). He has been an active volunteer in various IEEE technical activities for over 25 years. He served as General Chair, TPC Chair, and Symposium Chair for many international conferences. He served or is serving as an Editor or/and Guest Editor for numerous major technical journals. He served as Chair of the IEEE ComSoc Communications and Information Security Technical Committee from 2010 to 2012, and Chair of the IEEE ComSoc Radio Communications Committee from 2007 to 2008. He was the recipient of the Best Paper Award at IEEE WCNC 2008 and the 2008 IEEE Radio Communications Committee Outstanding Service Award. He is an elected BoG member of IEEE Communications Society. He is a Fellow of IET and BCS.