FOREWORD

Special Section on Deepening and Expanding of Information Network Science

Information networking technologies have been achieving tremendous growth as an indispensable infrastructure in our society. In particular, the recent advances in chip technology have required us to redefine the real world management of massive systems, which might be also complex and presumably made up with a variety of component devices, such as the Internet of Things. However, it is almost impossible to manage and control overall behavior of the whole system merely by knowing and assuming the behavior of its subsystems, such as independent devices or communication protocols being used in the network. Therefore, it is a sort of "recursive" approach that is quite essential for the real world implementation of the next generation networks. In this scenario, we first deepen the academic frameworks themselves for better explaining the onset of nontrivial behavior at macroscopic levels. Then, by applying such frameworks to our system, we reconsider and improve every specification for the components of the network to benefit its system performance, stability, or robustness. Thus, we planned to publish a special section to further promote research and development of progress in information network science and encouraged not only multidisciplinary studies around information communication technologies but also a wider spectrum of academic approaches including mathematical engineering, theoretical physics, biological system engineering, computer science, and applied mathematics, etc. This special section is the third bullet, following the May 2012 and Nov. 2013 issues focusing on information network science that were planned to foster such a challenging research area.

The Call for Papers attracted 17 full paper submissions. After careful review and much discussion, the editorial committee selected 10 papers (including three invited papers). The selected articles cover a variety of topics, including basic mathematical, physical investigation for information networks, novel analysis of information networks, etc. The submitted papers indeed include novel ideas and approaches; it was hard for the committee to select the ones for publications. We hope that the special section will help the readers share new knowledge and ideas and encourage further exciting investigations to foster the information network science.

As the guest editor-in-chief, I would like to express my sincere appreciation to all authors for their contributions and to all reviewers and members of the editorial committee for their great efforts in the review processes.

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Hiroyoshi Miwa (*Member*) received the B.S. degree in Mathematics from the University of Tokyo in 1992 and the Dr. of Informatics degree from Kyoto University in 2000. After joining NTT Laboratories in April 1992, he has been engaged in research on telecommunication network design and control issues. From April 2002 to March 2006, he was an Assistant Professor at the Department of Informatics, Kwansei Gakuin University, and from April 2006 to March 2012, he was an Associate Professor. He has been a Professor since April 2012. His research interests include the theory of combinatorial optimization for graphs and networks, discrete mathematics, and their application. He received the Best Magazine Paper Award from IEICE Communications Society in 2012, the Case Study Award from the Operations Research Society of Japan in 2014, and the Best Paper Award from IEEE COMPSAC in 2014. Prof. Miwa is a member of the IEEE, ACM, the Information Processing Society of Japan, and the Operations Research Society of Japan.