FOREWORD

Special Section on Heterogeneous Networks for Future Cellular Systems

With the increase in the amount of data traffic driven by a new generation of wireless devices, the demand for data rates has been increasing exponentially, especially in hot spots and indoor environments. To accommodate such an explosive increase in the amount of data traffic in a cost-effective manner, there has been increasing interest in *heterogeneous networks*, in which relays, distributed antennas, picocells, and femtocells are deployed on conventional macrocellular networks.

Heterogeneous networks inspire new wireless communications and signal processing challenges in the design of cellular systems. For example, these networks introduce additional interference but they can be coordinated, avoided, canceled, or managed in some other way using signal processing algorithms. Efficient traffic load balancing via smart cell association, resource allocation, and power control algorithms is also an important issue. In many settings, heterogeneous networks will require development of decentralized algorithms and autonomous operation of the nodes because of the delays and overhead in the backhaul connections between the nodes. Therefore, this special section was planned to promote further research and development in this area.

We received a total of 28 manuscripts. The Editorial Committee selected 13 papers and invited 2 tutorial papers. The Editorial Committee hopes that these excellent papers will encourage further research and development activities in this area on heterogeneous networks for future cellular systems.

As the Guest Editor-in-Chief, I would like to express my appreciation to all authors for their contributions and to all members of the Editorial Committee for their efforts in actualizing this outstanding special section.

Kenichi Higuchi (Tokyo Univ. of Science), Guest Editor-in-Chief

Kenichi Higuchi *(Member)* received the B.E. degree from Waseda University, Tokyo, Japan, in 1994, and received the Dr.Eng. degree from Tohoku University, Sendai, Japan in 2002. In 1994, he joined NTT Mobile Communications Network, Inc. (now, NTT DOCOMO, INC.). In NTT DOCOMO, INC., he was engaged in the research and development of wireless access technologies including code synchronization, multiple access, interference cancellation, and multiple-antenna transmission techniques for wideband DS-CDMA mobile radio, LTE, and broadband wireless packet access technologies for systems beyond IMT-2000. In 2007, he joined Tokyo University of Science. He is currently an Associate Professor at Tokyo University of Science. His current research interests are in the areas of wireless technologies and mobile communication systems. He was a co-recipient of the Best Paper Award of the International Symposium on Wireless Personal Multimedia Communications in 2004 and 2007, a recipient of the Young Researcher's Award from the IEICE in 2003, the 5th YRP Award in 2007, and the Prime Minister Invention Prize in 2010. He is a member of the IEEE.