
FOREWORD

Joint Special Section on Opto-electronics and Communications for Future Optical Network

Through the deployment of 5G network and their upgrade to Beyond 5G, communication between physical space and cyber space is expected to enhance dramatically toward 2030. By analyzing huge amounts of digital data through the use of AI, any systems should be better navigated toward optimization for higher efficiency, larger creativity and lower energy consumption. Considering the data traffic and the number of communication devices in such future systems, the throughput required to the optical network will be 100 times the current one. In addition, it is important to realize such network with higher power efficiency, lower latency, high reliability, and lower operational complexity.

Based on such background, the 27th Optoelectronics and Communications Conference and International Conference on Photonics in Switching and Computing (OECC/PSC 2022) was held in Toyama, Japan from July 3rd to July 6th, 2022. The following seven categories were covered a wide range of topics:

O1: Core/Access / Data Center Networks and Subsystems

O2: Transmission Systems and Subsystems

O3: Optical Fibers, Cables and Fiber Devices

O4: Optical Active Devices and Modules

O5: Optical Passive Devices and Modules

P1: Photonic Switching Devices, Systems, and Networks

P2: Photonics for Computing and Deep Learning Applications

OECC/PSC 2022 was especially characterized by three main special symposia: Symposium S1 on “The Future of Coherent Optical Communication Systems”, Symposium S2 on “Large-scale and Highly-functional Photonic integrated circuits and devices”, and Symposium S3 on “Photonic technologies towards attaining SDGs in Post-COVID Era”.

This joint special section organized by both IEICE Transactions on Communication and IEICE Transactions on Electronics provides an overview of the key topics discussed in OECC/PSC 2022. This Special Section on Communication consists of 3 excellent invited papers and 5 contributed papers, which were selected from submissions on the technical categories O1, O2, O3, P1 and P2.

I would like to appreciate all of the authors for submitting the excellent papers and to reviewers and editorial committee members for their great effort on organizing this special section.

Special Section Editorial Committee Members

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Takeshi Hoshida (Fujitsu), Guest Editor-in-Chief

Takeshi Hoshida (*Senior Member*) received his B.E., M.E., and Ph.D. degrees in electronic engineering from the University of Tokyo, Tokyo, Japan, in 1993, 1995, and 1998, respectively. Since he joined Fujitsu Laboratories Ltd., Kawasaki, Japan, in 1998, he has been engaged in the research and development of dense wavelength division multiplexing optical transmission systems. From 2000 to 2002, he was with Fujitsu Network Communications, Inc., Richardson, Texas. Since 2007, he has been with Fujitsu Limited, Kawasaki, Japan, and he currently leads Fujitsu's optical transmission research activities. Dr. Hoshida received IEICE Communications Society OCS Best Paper Award in 2008, IEICE Communications Society OCS Best Paper Award in 2010, the IEICE Communications Society Distinguished Contributions Award in 2016, the Best Tutorial Paper Award in the IEICE Transactions on Communications (Japanese Edition) in 2019, the Commendation for Science and Technology by the Ministry of Education, Culture, Sports, Science and Technology (Awards for Science and Technology in Development Category) in 2020, and the Japan Patent Office Commissioner Award of the National Commendation for Invention in 2020. He is a member of the Japan Society of Applied Physics (JSAP), a senior member of the Institute of Electrical and Electronics Engineers (IEEE) and a senior member of the Institute of Electronics, Information and Communication Engineers (IEICE).

