The 1st Hokkaido Young Professionals Workshop

Muroran and Online, 2021.10.14

Program

Thursday, October 14, 2021	
14:45 to 14:55	Opening Remark by IEEE Sapporo YP Chair
14:55 to 15:55	Student Presentation Contest
15:55 to 16:15	Mini Quiz Session for Attendees
16:15 to 16:55	Keynote Speech 1: Design Techniques for Wireless Communication and Image Processing IP Cores Prof. Hiroshi Tsutsui, Hokkaido University
16:55 to 17:05	Coffee Break
17:05 to 17:45	Keynote Speech 2: Silicon Photonics for Optical Processing Unit Prof. Takanori Sato, Hokkaido University
17:45 to 17:50	Closing

IEEE Sapporo YP

Committee Members

❖ *Organized by IEEE Sapporo YP*

- Chair: He Li (Muroran Institute of Technology)
- Vice Chair: Takanori Sato (Hokkaido University)
- Secretary: Xun Shao (Kitami Institute of Technology)
- Treasurer: Jianwen Xu (Muroran Institute of Technology)

❖ *Co-organized by Muroran IT SB*

- Chair: Zujun Tang Vice Chair: Jiong Dong
- Secretary: Koki Furakawa Treasurer: Ayaka Oki

❖ *Co-organized by ENeS Lab*

❖ *Supported by the **IEEE R10 Young Professionals New and Dormant Affinity Group Fund 2021***

Design Techniques for Wireless Communication and Image Processing IP Cores

Hiroshi Tsutsui, Associate Professor, Hokkaido University

Abstract:

The advancement of CMOS device downsizing has increased the capacity of wireless communication and the resolution of various kinds of imaging/display devices dramatically. In addition, large-scale integrated circuits enable us to implement systems on one chip, and IP cores (semiconductor intellectual property cores) are widely used to build such SoC (system-on-a-chip). When implementing a specific process as an IP core, storing intermediate data and how to process them without noticeable latency are keys for efficient implementations. In this talk, the speaker introduces IP core design techniques for real-time processing of large volume data, such as MIMO-OFDM (multiple-input multiple-output orthogonal frequency-division multiplexing), image codecs, and image enhancement IP cores.

Biography:

Hiroshi Tsutsui received his B.E. degree in Electrical and Electronic Engineering and his master and Ph.D. degrees in Communications and Computer Engineering from Kyoto University in 2000, 2002, and 2005, respectively. He is currently an associate professor in Division of Media and Network Technologies, Hokkaido University. His research interests include circuits and systems and VLSI design methodology. He served as publication chair of several international conferences and as the general chair or SISA 2021. He is a member of IEEE, ACM, IPSJ, IEEJ, IIEEJ, and the Institute of Image Information and Television Engineers, and a senior member of IEICE.

Silicon Photonics for Optical Processing Unit

TAKANORI SATO, ASSOCIATE PROFESSOR, HOKKAIDO UNIVERSITY

Abstract:

Silicon integrated optical circuit, called Silicon Photonics, has received much attention because it enables faster and low-energy data transfer in conventional electronics. In the infrared band, Si is a transparent medium and forms the total internal reflection structure by surrounding SiO2, and thus silicon photonics has much compatibility with the CMOS platform. Recently, various types of optical computing devices based on silicon photonics have been reported. For overcoming the limitation of electronic computation performance, the harmonization of electronics and photonics is an important key. This time, the speaker will talk about the operation principle and application of the photonic full adder and the photonic matrix multiplier for optical communication as well as optical computing.

Biography:

Takanori Sato was born in Date city, Hokkaido, Japan, in 1992. He received his Ph.D. degree in the field of media and network technologies from Hokkaido University in 2018. He was a Research Fellow of JSPS from 2017 to 2019. He moved to the University of Hyogo as an assistant professor in 2019 and is currently an associate professor at Hokkaido University. His research interests include the theoretical and numerical studies of optical fibers and photonic circuits using the coupled-mode theory and the finite element method. He is a member of the IEICE, JSAP, OSA, and IEEE.