

Keynote for ITNAC 2022 - Robert Minasian

Integrated Silicon Photonics Signal Processing and Sensing

Abstract:

Integrated silicon photonics signal processing offers a new powerful paradigm that enables the realisation of functions that are difficult or not even possible to be achieved using electronic techniques. This exploits the inherent advantages of photonics including wide bandwidth and immunity to electromagnetic interference. Photonic signal processors are intrinsically compatible with optical-wireless systems, and can provide connectivity with in-built signal conditioning for overcoming a range of challenging problems. Recently, there has been a significant global drive to achieve integration of photonic signal processors on silicon platforms, especially since this leverages the CMOS fabrication technology to enable boosting the performance of future systems performing communications and sensing with the potential for implementing high bandwidth, fast and complex functionalities. Advances in silicon photonics integrated signal processing are presented. These include dense optical integration techniques for LIDAR on-a-chip systems, widely tunable microwave photonic filters, multi-function and programmable photonic signal processors, and high-resolution integrated sensors for IoT. These photonic processors herald new capabilities for achieving high-performance signal processing.

Bio:



Robert A. Minasian (S'78–M'80–SM'00–F'03) received the B.E. degree from the University of Melbourne, Melbourne, Australia, the M.Sc. degree from University College London, U.K., and the Ph.D. degree from the University of Melbourne.

He is a Chair Professor with the School of Electrical and Information Engineering at the University of Sydney, Australia. He is also the Founding Director of the Fibre-optics and Photonics Laboratory.

His research has made key contributions to microwave photonics and photonic signal processing. He is recognized as an author of one of the top 1% most highly cited papers in his field worldwide. Professor Minasian has contributed over 400 research publications, including Invited Papers in the IEEE Transactions and OSA Journals. He has 84 Plenary, Keynote and Invited Talks at international conferences. He is an Associate Editor of Optical Fiber Technology.

He has served on numerous program, technical and steering committees of international conferences. He has also served on the Australian Research Council and on the Research Evaluation Committee for the Excellence in Research for Australia initiative.

Professor Minasian was the recipient of the ATERB Medal for Outstanding Investigator in Telecommunications awarded by the Australian Telecommunications and Electronics Research Board. He is a Life Fellow of the IEEE, a Fellow of the Optical Society of America (now Optica), and a Fellow of The Royal Society of NSW.