The Department of Electronics, Carleton University and IEEE Ottawa EDS/SSCS/CASS Chapter are inviting all interested IEEE members, entrepreneurs, academics, scientists, industry leaders, engineers, technologists, and students to the Seminar on:

SSCS Distinguished Lecture

CMOS Transceiver Circuits for Short-Reach Optical Communication

By

Prof. Tony Chan Carusone

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DATE: Fri, Jan 15, 2016.
TIME: 11:30am– 12:30pm
PLACE: ME4124, Mackenzie Eng. Building, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario, Canada

Refreshments: will be served.
ADMISSION: Free.

Abstract

Optical links 1 – 100 metres in length require low cost, low power consumption and small size. Vertical cavity surface emitting lasers (VCSELs) can be arrayed inexpensively and can be directly modulated, avoiding the need for separate optical modulator components. VCSELs operating at 850nm coupled to multimode fiber offer a compact and inexpensive optoelectronic assembly, and are predominant for short reach optical communication. The key challenge for the transmitter circuit in such systems is to modulate single-ended VCSEL currents up to about 10mA at 25+Gb/s while maintaining bias voltages of approximately 2V across the VCSELs. At the receiver, a key challenge is to provide adequate sensitivity using photodiodes with wide (50um) aperture and, hence, large capacitance. Current commercial transceiver circuits are realized in SiGe BiCMOS, which is advantageous at both the transmitter and receiver, but CMOS offers the potential for higher levels of integration and lower power consumption. Our research efforts on low-power CMOS VCSEL drivers and optical receivers will be presented, including several 65nm CMOS designs.

Speakers' Bio

Tony Chan Carusone received his Ph.D. in Electrical and Computer Engineering at the University of Toronto in 2002, and has been a faculty member there ever since. He co-authored the best paper at the 2005 Compound Semiconductor Integrated Circuits Symposium, the best student papers at the 2007, 2008, and 2011 Custom Integrated Circuits Conferences, the best invited paper at the 2010 Custom Integrated Circuits Conference, and the best young scientist paper at the 2014 European Solid-State Circuits Conference. He has served as Editor-in-Chief of the IEEE Transactions on Circuits and Systems II: Express Briefs, and as a member of the Technical Program Committee for several international conferences including the International Solid-State Circuits Conference. He currently serves on the editorial board of the IEEE Journal of Solid-State Circuits.

Prof. Chan Carusone is a regular consultant to industry in the areas of analog, mixed-signal, and communication integrated circuit design, and is an author, along with David Johns and Ken Martin, of the 2nd edition of the classic textbook "Analog Integrated Circuit Design".