Abstract

Current-mode circuits where information is represented by branch currents rather than nodal voltages possess many unique characteristics over their voltage-mode counterparts including small nodal time constants, large current swing in the presence of a low supply voltage, a low input impedance, a high output impedance, a low level of distortion, less sensitive to switching noise, and better ESD immunity. Current-mode circuits have found increasing applications in telecommunication systems, instrumentation systems, analog signal processing, high-speed computer interfaces, and the backplane of complex electronic systems. This talk will focus on a number of critical aspects of current-mode circuits for high-speed data communications, such as why data communications over wire channels are critical?, the scaling of CMOS technology, current-mode versus voltage-mode, electrical signaling for data communications over wire channels, configurations of data links, and design challenges of high-speed data links.

Biography of Speaker

Fei Yuan received the BEng. degree in electrical engineering from Shandong University, Jinan, China in 1985, the MASc. degree in chemical engineering and PhD. degree in electrical engineering from University of Waterloo, Canada in 1995 and 1999, respectively. He joined the Department of Electrical and Computer Engineering, Ryerson University in 1999 and is currently a Professor. He is the author of the books CMOS circuits for passive wireless microsystems (Springer, New York, 2010), CMOS active inductors and transformers: principle, implementation, and applications (Springer, New York, 2008), CMOS current-mode circuits for data communications (Springer, New York, 2006) and the co-author of the book Computer methods for analysis of mixed-mode switching circuits (Kluwer Academic, Boston, 2004, with Ajoy Opal). In addition, he authored / coauthored of some 150 research papers in refereed journals and conference proceedings. Dr. Yuan was awarded the Ryerson Research Chair from Ryerson University in Jan. 2005 and is currently the Chair of the Department of Electrical and Computer Engineering, Ryerson University.