



Speaker: Timothy O. (Tod) Dickson, Ph.D.
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Talk Title: High-Speed CMOS Serial Transmitters for 56-112Gb/s Electrical Interconnects

Date: Monday, November 23, 2020

Time: 4:30 – 5:30 p.m.

Zoom link: Meeting link below



Abstract: Data rates in high-speed wireline communication links continue to increase, fueled by demands in data center and high-performance computing applications. In recent years, serial link data rates have increased from 28Gb/s to 56Gb/s, with 112Gb/s rapidly approaching. To achieve these higher data rates across high-loss electrical channels, standards are switching from NRZ to PAM4 signaling. In this talk, we will start with an overview of serial transmitter architectures focusing on feed-forward equalization (FFE) techniques as well as power considerations for PAM4 links. Next, we will look at the design of a 56-Gb/s PAM4 transmitter designed in 14nm FinFET CMOS technology with a fractionally-spaced FFE. Finally we will look at directions for 112Gb/s and discuss the design of a 112-Gb/s PAM4 transmitter in 14nm FinFET CMOS technology with precise equalization control to minimize intersymbol interference in PAM4 links.

Bio: Timothy (Tod) Dickson received the B.S. and M.Eng. degrees at the University of Florida, and the Ph.D. degree at the University of Toronto. Since 2006, he has been with the IBM T.J. Watson Research Center in Yorktown Heights, NY. He currently leads research projects investigating high-speed power-efficient I/O solutions for electrical and optical wireline communication links. He is also an Adjunct Professor at Columbia University in New York, NY, where he teaches graduate courses in analog and mixed-signal circuit design. He has received numerous best paper awards, including the IEEE Journal of Solid-State Circuits Best Paper Award in 2009, and the IEEE Custom Integrated Circuits Conference (CICC) Best Paper Award in 2015. He is an Associate Editor for the IEEE Solid State Circuits Letters, and serves on the Technical Programming Committee of the IEEE CICC. He is a Senior Member of the IEEE, and a Solid State Circuits Society Distinguished Lecturer for 2019-2020.

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