



THE CHINESE UNIVERSITY OF HONG KONG
Department of Electronic Engineering

SEMINAR

Integrated Photonics for Interconnects, Computation and Sensing

By

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Time: 10:00 a.m.

Venue: Rm 222 Ho Sin Hang Engineering Building, The Chinese University of Hong Kong

Abstract:

Integrated photonics is poised to revolutionize inter- and intra-data center communications since internet traffic continues to increase exponentially making it difficult and costly for existing switching and interconnects in data centers to cope with the fast-growing bandwidth requirement. Integrated photonics is able to contribute data centers in terms of the lower cost, higher bandwidth, and lower power consumption. As many fundamental components including the power-efficient modulators mature, silicon photonics is believed to have reached the tipping point with a surging global market. Besides the optical interconnects, integrated photonics also shows the promise in abundant applications, ranging from high performance optical computing and autonomous cars, to biomedical sensing and even aerospace applications.

In this seminar, an overview of the integrated photonics as well as a potential trend for 2024 and beyond will be provided. First, the recent development of optical components including passive and active modules as well as optical circuits will be presented. Second, as Moore's law has been approaching the physical limitation, photonics-based high-performance computing is envisioned as a potential answer to the continuation of Moore's law. We propose and experimentally demonstrate photonics-assisted digital and analog optical computing which is capable of operating at a higher frequency than electrical counterparts while consuming less power and less latency. This paves the way to the future integrated high-speed and power-efficient optical computing. Mid-IR optical phased array (OPA) and sensing related applications will also be addressed in the presentation.

Biography:



Ray T. Chen at UT Austin has reported its research findings in more than 970 publications, including over 100 invited papers and 74 patents. He has chaired or been a program-committee member for more than 120 domestic and international conferences organized by IEEE, SPIE (The International Society of Optical Engineering), OSA, and PSC. He has served as an editor, co-editor or coauthor for over twenty books. Chen has also served as a consultant for various federal agencies and private companies and delivered numerous invited talks to professional societies. Chen is a Fellow of NAI, IEEE, OSA, and SPIE. He was the recipient of the 1987 University of California Regent's Dissertation Fellowship and the 1999 UT Engineering Foundation Faculty Award, for his contributions in research, teaching and services. He received the honorary citizenship award in 2003 from the

Austin city council for his contribution in community service. He was also the recipient of the 2008 IEEE Teaching Award, and the 2010 IEEE HKN Loudest Professor Award. 2013 NASA Certified Technical Achievement Award for contribution on moon surveillance conformable phased array antenna. In 2022, he was elected as the fellow of National Academy of Inventors, the highest professional distinction awarded to academic inventors.

Chen served as the CTO, Founder, and Chairman of the Board of Radiant Research, Inc. from 2000 to 2001, where he raised 18 million dollars A-Round funding to commercialize polymer-based photonic devices involving over twenty patents, which were acquired by Finisar in 2002, a publicly traded company in the Silicon Valley (NASDAQ:FNSR). He also serves as the founder and Chairman of the Board of Omega Optics Inc. since its initiation in 2001. Omega Optics has received over five million dollars in research funding. His research work has been awarded over 140 research grants and contracts from such sponsors as Army, Navy, Air Force, Space Force, DARPA, MDA, NSA, NSF, DOE, EPA, NIST, NIH, NASA, the State of Texas, and private industry. Experiences garnered through these programs are pivotal elements for his research and further commercialization.

Chen has supervised and graduated 59 PhD students and over 40 postdocs from his research group at UT Austin. Many of them are currently professors in the major research universities in USA and abroad

ALL ARE WELCOME

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