

Title:

Large-Scale Silicon Photonic MEMS Switches

Abstract:

Silicon photonics has emerged as a promising solution to address the interconnect bottleneck in high performance computing systems and data centers. Silicon photonics provides unprecedented I/O bandwidth, enabling ultrahigh aggregated bandwidth (~ 10 Tbps), high bandwidth density (\sim Tbps/mm), and high energy efficiency (\sim pJ/bit). In addition, silicon photonics also enable optical switching with large port count and short switching time. This talk will provide an overview of the state of the art of silicon photonic switches, with emphasis on new micro-electro-mechanical-system (MEMS)-actuated switching mechanism. Large scale (240x240) switches have been demonstrated, as well as wavelength-selective switches with 8x8 ports and 8 wavelengths. Future scaling to even larger port count will be discussed.

Bio:

Ming C. Wu is Nortel Distinguished Professor of Electrical Engineering and Computer Sciences and Co-Director of Berkeley Sensor and Actuator Center (BSAC) at the University of California, Berkeley. Dr. Wu received his B.S. degree in Electrical Engineering from National Taiwan University in 1983, and M.S. and Ph.D. degrees in Electrical Engineering and Computer Sciences from the University of California, Berkeley in 1986 and 1988, respectively. From 1988 to 1992, he was Member of Technical Staff at AT&T Bell Laboratories, Murray Hill, New Jersey. From 1992 to 2004, he was Professor of Electrical Engineering at the University of California, Los Angeles (UCLA). He has been a faculty member at Berkeley since 2004. His research interests include silicon photonics, optoelectronics, MEMS, MOEMS, and optofluidics. He has published 8 book chapters, over 600 papers in journals and conferences, holds 35 U.S. patents. His research in optoelectronic tweezers has been successfully commercialized by Berkeley Lights (NASDAQ: BLI).

Prof. Wu is Fellow of IEEE and Optical Society (OSA), and a Packard Foundation Fellow (1992 – 1997). He was a member of the IEEE Photonics Society Board of Governors from 2013 to 2016. He received the Paul F. Forman Engineering Excellence Award in 2007 (OSA), the IEEE Photonics Society William Streifer Scientific Achievement Award in 2016, the C.E.K. Mees Medal in 2017 (OSA), and the Robert Bosch Micro and Nano Electro Mechanical Systems Award (IEEE).