

Rejuvenate Post-Moore's Law Information Systems with Photonics-Electronics Codesign

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Abstract

Information systems, from HPC and data center to automobile, aircraft, and cellphone, are integrating growing numbers of processors, accelerators, memories, and peripherals to meet the burgeoning performance requirements of new applications under tight cost, energy, thermal, space, and weight constraints. Silicon photonics technologies piggyback onto developed silicon fabrication processes to provide viable and cost-effective solutions. A large number of silicon photonics devices and circuits have been demonstrated in CMOS-compatible fabrication processes.

Silicon photonics technologies open up both new opportunities and new challenges to applications, architectures, design techniques, and design automation tools for hybrid photonics-electronics information systems. Based on our decade-long quest to transform information systems with silicon photonics, this talk tries to answer several key questions. How could information systems benefit from silicon photonics technologies? What technologies are required? And what are the challenges?

Biography

Prof. Jiang Xu is the acting Department Head of Microelectronics Thrust at Hong Kong University of Science and Technology (HKUST). He received his PhD from Princeton University and worked at Bell Labs, NEC Labs, and a startup company before joining HKUST. Jiang established Big Data System Lab, Xilinx-HKUST Joint Lab, and OPTICS Lab at HKUST. He currently serves as the Associate Editor for IEEE TCAD and TVLSI. He served on the steering committees, organizing committees, and technical program committees of many international conferences, including DAC, DATE, ICCAD, CASES, ICCD, CODES+ISSS, NOCS, HiPEAC, ASP-DAC, etc. Jiang was an IEEE Distinguished Lecturer and an ACM Distinguished Speaker. He authored and coauthored more than 130 book chapters and papers in peer-reviewed international journals and conferences. His research areas include machine learning system, photonic-electronic codesign, optical interconnection network, power delivery and management, MPSoC, low-power embedded system, hardware/software codesign.