Special Issue

Silicon Photonics–CMOS Integration and Device Applications

Message from the Guest Editor

Silicon photonics and photonic integrated circuits (PICs) using CMOS processes will take a key role in new emerging applications such as artificial intelligence (AI), light detection and ranging (LiDAR) sensors for autonomous vehicles and drones, next-generation nuromorphic computing systems, and quantum computing systems. Following the surprisingly fast increase in AI industry demands for high-performance transceivers to process data at speeds up to terabits per second, power-efficient high-speed optical interconnects have become more and more crucial for AI-driven world industries. Although CMOS PICs face various challenges including material limitations, complicated integration levels, initial cost issues, and long manufacturing times, a number of key players in semiconductor industries have paid a great deal of attention to these PICs to build high-speed transceivers for AI and data center applications. In this respect, silicon photonis and PICs using CMOS processes represent the leading technologoies in the imminent AI-driven market.

Guest Editor

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