Brett Brune
Editor in Chief

Shifts in microchip-making to aid automotive, medical

Does it sound like a big deal to integrate lasers onto photonic integrated circuits (PICs)? What about using silicon to make PICs? And what about co-packaging optics with electronics? Each of these moves is big.

AIM Photonics is figuring prominently in all three dramatic shifts in the making of microchips. And the upshot, according to John Bowers, the institute's acting CEO, is the U.S. is winning a global battle for domination in integrated photonics.

Importantly, manufacturers embracing artificial intelligence and machine learning (AI/ML) will benefit greatly, he said.

"The chips that Intel and Broadcom announced recently are 25-terabyte/second chips, so that's … 25 million megabytes/second," Bowers said. "That's how much data each of them processes. It lets your networks just keep getting faster and more complex, so they can handle more data."

AI and ML "take huge amounts of computing capacity," he said. "And for data centers to be able to handle that, they need this much higher capacity," which is partly due to the fact that capacity of an optical fiber is 1,000 times that of an electrical wire, and that the signal loss in fiber optics is "about 1,000 times lower than electrical wires."

Big advancements are on the horizon—for many, he predicted: "Before long, the processor in your computer will be communicating with other chips in your computer optically. That is a huge revolution. What that really drives is silicon photonics. Because now you need to be doing everything on silicon since the chips all need to have the same expansion coefficient."

Automotive and medical are bound to be profoundly impacted by AIM Photonics' work—because those industry segments are becoming more dependent on AI and machine learning by the day, Bowers said. Lidars and gyroscopes for self-driving cars will benefit. So will sensors used in, for example, COVID-19 detection.

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