Empowering flexible and scalable high performance architectures with embedded photonics

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Abstract:

The recent explosive growth in data analytics applications that rely on machine and deep learning techniques are seismically changing the landscape of high performance architectures. These techniques rely on graphics processing units (GPU) and manycore (CPU) technologies whose need for intense performance is pushing current interconnect networks to their limits. Driven by these applications, the execution performance along with the energy consumption of massive parallel systems is increasingly determined by how data is moved among the numerous compute and memory resources. Embedded photonic interconnect technologies can address critical data-movement challenges by delivering higher communication bandwidth densities at significantly improved energy efficiencies. New disaggregated architectures enabled by embedded photonics and optical bandwidth steering can reduce the system-wide energy consumption.

Brief Biography:

Keren Bergman is the Charles Batchelor Professor of Electrical Engineering at Columbia University where she also serves as the Scientific Director of the Columbia Nano Initiative. Prof. Bergman received the B.S. from Bucknell University in 1988, and the M.S. in 1991 and Ph.D. in 1994 from M.I.T. all in Electrical Engineering. At Columbia, Bergman leads the Lightwave Research Laboratory encompassing multiple cross-disciplinary programs at the intersection of computing and photonics. She is a Fellow of the Optical Society of America (OSA) and IEEE.