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"Nanophotonic design: AI & The frontier"

OWEN MILLER

Assoc. Prof. of Applied Physics & Energy Sciences Institute
Yale University

Bio: Owen Miller is an Assoc. Prof. of Applied Physics and the Energy Sciences Institute at Yale. His research group uses techniques from applied mathematics to explore the extreme limits of nanophotonics and broader wave physics. This research, in collaboration with experimental and industrial teams, has led to new photonic computational design approaches, a wide array of photonic fundamental limits, as well as record-setting performance in applications ranging from photovoltaics to smoke grenades. He is the recipient of AFOSR and DARPA young investigator awards, as well as the Yale Graduate Mentor award.

Abstract: Nanophotonics offers the promise of extraordinary sculpting of the flow of light, for applications from optics-based analog computing to augmented reality. A critical need is for design tools for photonics that scale to the form factors of optics ("photonic VLSI"). Can AI help us achieve this? Where is the current frontier? What are the key advantages/disadvantages of AI? How else can AI help us leverage photonics for large-scale applications? I will give my perspective on these questions.