

ECE Distinguished Lecture Series



Dr. Bahram Jalali

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Physics-AI Symbiosis: How to Utilize Physics to Enhance Artificial Intelligence

February 23, 4:00pm

Meeting link: <https://gwu.webex.com/gwu/j.php?MTID=mb8a129e71583e0e69160b697ec21b201>

Meeting number: 120 925 3123

Password: BNpEkXiM642

Abstract:

Artificial intelligence (AI) has evolved from an esoteric academic subject to one that permeates daily human lives. Deep neural networks exploit millions or more free parameters that are tuned to a requisite large and curated dataset. The black-box nature of these models masks interpretability and the ability to diagnose failures. Although astonishing performance gains are being achieved, these come at the expense of exponential rise in computation and memory utilization. Recent innovations that blend physics and neural networks confront these emerging challenges. For example, Physical phenomena such as diffusion and diffraction are being exploited to accelerate digital computing. Neural networks are being utilized for the joint inverse design of optical systems and algorithms and to solve differential equations. This talk will review how the emerging convergence of physics and neural networks as well as new imaging modalities will confront these challenges and extend the rise of artificial intelligence.

Biography:

Bahram Jalali is the Director of the Photonics Laboratory, the Fang Lu Endowed Chair in Engineering and Professor of Electrical and Computer Engineering at UCLA with joint appointments in Biomedical Engineering, and the California NanoSystems Institute (CNSI). He received his Ph.D. in Applied Physics from Columbia University in 1989 and was with the Physics Research Division of Bell Laboratories in Murray Hill, New Jersey until 1992 before joining UCLA. He is a Fellow of IEEE, OSA, APS, AIMBE, and SPIE. He is the recipient of the R.W. Wood Prize from the Optical Society of America for the first silicon laser, the Aaron Kressel Award from IEEE, and the Achievement Medal from IET (U.K), and the Pioneer in Technology Award from the Society of Brain Mapping & Therapeutics. Bahram was the Founder and CEO of Cognet Microsystems, a semiconductor IC company acquired by Intel in 2001. He was elected into the Scientific American Top 50 and MIT Technology Review Magazine Top 10.