



Bilkent EEE

Bilkent EEE Distinguished Seminar Series

Bilkent University - Department of Electrical and Electronics Engineering



Diffractive Optical Networks & Computational Imaging Without a Computer

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EE-01

I will discuss diffractive optical networks designed by deep learning to all-optically implement various complex functions as the input light diffracts through spatially-engineered surfaces. These diffractive processors designed by deep learning have various applications, e.g., all-optical image analysis, feature detection, object classification, computational imaging and seeing through diffusers, also enabling task-specific camera designs and new optical components for spatial, spectral and temporal beam shaping and spatially-controlled wavelength division multiplexing. These deep learning-designed diffractive systems can broadly impact (1) all-optical statistical inference engines, (2) computational camera and microscope designs and (3) inverse design of optical systems that are task-specific. In this talk, I will give examples of each group, enabling transformative capabilities for various applications of interest in e.g., autonomous systems, defense/security, telecommunications as well as biomedical imaging and sensing.

Bio: Dr. Ozcan is the Chancellor's Professor and the Volgenau Chair for Engineering Innovation at UCLA and an HHMI Professor with the Howard Hughes Medical Institute. He is also the Associate Director of the California NanoSystems Institute. Dr. Ozcan holds >55 issued/granted patents, and is the co-author of >950 peer-reviewed publications in leading scientific journals/conferences. He is elected Fellow of National Academy of Inventors (NAI), Optica/OSA, AAAS, SPIE, IEEE, AIMBE, RSC, APS and the Guggenheim Foundation. Dr. Ozcan is also listed as a Highly Cited Researcher by Web of Science.

