Department of Electrical and Computer Engineering

TEXAS TECH UNIVERSITY
Edward E. Whitacre Jr.
College *of* Engineering

Fall 2024 Seminar Series

Seminar Title: *Flat optics with deep learning technics*
Time: 3:00-3:50 PM, Monday, Sept 16, 2024
Location: Holden Hall 104

Speaker:
Sensong An
University of North Texas

Abstract:
Metasurfaces offer significant potential for shaping optical wavefronts and achieving multifunctional behavior while maintaining a compact form factor compared to traditional bulky optical devices. Despite their advantages in precision and functionality, designing individual meta-atom structures to meet specific electromagnetic requirements remains a challenging and time-consuming task. This complexity is further exacerbated by the additional design degrees of freedom (DOF) introduced by freeform shapes and reconfigurable materials, which complicate the design process even more. This presentation explores several deep neural network approaches aimed at accelerating both the forward modeling and inverse design of meta-atoms and metasurfaces with high DOF. The capabilities of these networks are demonstrated through examples of freeform and reconfigurable metasurface designs generated by well-trained neural network frameworks.

Speaker Bio:
Dr. Sensong An is an Assistant Professor at the University of North Texas. Before joining UNT, he worked as a Research Scientist at META Reality Labs from 2022 to 2023 and served as a Postdoctoral Researcher at MIT from Fall 2021 to Summer 2022. He earned his PhD in Electrical and Computer Engineering from the University of Massachusetts Lowell in 2021. Prior to his doctoral studies, he obtained both his BS and MS degrees in Electrical Engineering from the University of Science and Technology of China in 2013 and 2016, respectively.
His research interests span several sub-areas of Electromagnetics, including microwave engineering, nano-optics, and the application of machine learning techniques to metamaterials, metasurfaces, and the design of microwave components.

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