COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

FACULTY RESEARCH TALKS

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Zoom talk | Friday, Jan. 16, 2026 | Noon to 1 p.m.

Presenter 1:
SAIKAT DEY
ASSISTANT PROFESSOR
Electrical and Computer Engineering

Design and Performance Optimization of Next Generation Power Electronics

Isolated multi-port power converters are gaining attention for microgrids, EVs, solid-state transformers, energy storage, and space/data-center power supplies. They offer bidirectional power flow, galvanic isolation, multi-voltage interfacing, high efficiency and power density, and reduced component count. However, adoption is limited by elevated semiconductor and magnetic losses at light load and non-unity gain, along with port cross-coupling through the shared magnetic link. Saikat Dey will review these challenges and presents solutions using converter design and modulation optimization, integrated magnetics, and neural-network-in-loop intelligent control, and outlines directions toward next-generation power converters.

Dey received his doctorate from Arizona State University and worked as a power electronics design engineer at Tagore Technology (now GlobalFoundries). His research focuses on the design, modeling, optimization and control of high-frequency, high-density wide-bandgap power converters, with applications in clean energy, transportation electrification, space/extreme-environment electronics, and AI-assisted parameter estimation. Dey has authored/co-authored one book, more than 40 IEEE publications, and has five pending U.S. patents. His honors include the 2025 Dean's Dissertation Award, the 2023 IEEE Transactions on Power Electronics Second Place Prize Paper Award, and the 2023 Taiwan Semiconductor ASU Fellowship.

Presenter 2:
XISHUN LIAO
ASSISTANT PROFESSOR
Civil, Environmental and Construction Engineering, Knights Digital Twin Initiative

Building Digital Twins for Smarter Mobility: From Individuals to Cities

In this talk, Xishun Liao will present mobility digital twins that link AI agents, transportation networks and resident digital twins to simulate city dynamics from individuals to mega cities. A deep activity model generates realistic daily activity chains and traffic demand using generative deep learning, geospatial intelligence, and multimodal data, supporting urban planning, mobility optimization, public safety, and real time intervention.

Liao's interdisciplinary expertise spans intelligent transportation systems, human mobility behavior, urban intelligence, geospatial science and digital twin technology. Before joining UCF, Liao served as an assistant project scientist at the University of California, Los Angeles, where he led cutting-edge research in AI and mobility digital twins. He earned his doctorate in electrical and computer engineering from University of California, Riverside and his master's degree from University of Maryland, College Park. Liao has showcased his innovations at the Consumer Electronics Show and won the Best Paper Award from the IEEE Intelligent Transportation Systems Society.

Presenter 3:
SONG WANG
ASSISTANT PROFESSOR
Computer Science, Institute of Artificial Intelligence

Reliable Collaborative Intelligence for Healthcare

Song Wang will present a principled view of how large language models (LLMs) can be safely and effectively integrated into medical decision-making. The talk introduces recent advances in LLMs, their role in explainable healthcare, and emerging multi-agent collaborative systems for diagnosis and reasoning. Emphasis is placed on trustworthiness, interpretability, and human-in-the-loop design, highlighting future directions toward reliable, privacy-aware, and clinically grounded AI systems for healthcare.

Wang's research focuses on reliable and interpretable machine learning, large language models, and multi-agent intelligence, with a particular emphasis on healthcare and biomedical applications. His work explores interpretability and trustworthy reasoning, and collaborative multi-agent frameworks for diagnosis (e.g., Alzheimer's disease and mental disorders) and biomedical discovery using multi-modal data such as neuroimaging, genetics, multi-omics data, and clinical records.

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