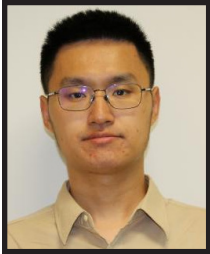




# FACULTY RESEARCH TALKS

LISTEN. LEARN. COLLABORATE.

Zoom talk | Friday, Feb. 13, 2026 | Noon to 1 p.m.



**Presenter 1:**  
**JIALIN LIU**  
**ASSISTANT**  
**PROFESSOR**  
**Data, Mathematical**  
**and Statistical**  
**Sciences**

## **Deep Implicit Models: Richer Equilibria and Test-Time Scaling**

This research characterizes the expressive power of deep implicit models by examining their equilibrium structures. Jialin Liu proves that these equilibria can represent significantly more complex functional mappings than traditional end-to-end architectures. Critically, he demonstrates that their expressive capacity scales directly with test-time compute, enabling performance gains through increased inference iterations. His team's theoretical findings are validated across diverse examples, including differential equations, optimization tasks, and large language model reasoning.

Jialin Liu is an assistant professor in the School of Data, Mathematical and Statistical Sciences at the University of Central Florida. His research bridges machine learning theory and AI for mathematics, such as optimization and partial differential equations. He previously held a senior algorithm engineer position at Alibaba DAMO Academy and received his doctorate in mathematics from the University of California, Los Angeles. Dedicated to developing stable, explainable and mathematically grounded AI, his contributions have earned top-rated and spotlight recognition at the International Conference on Learning Representations (ICLR) and the Conference on Neural Information Processing Systems (NeurIPS).



**Presenter 2:**  
**YUXUN REN**  
**ASSISTANT**  
**PROFESSOR**  
**Materials Science**  
**and Engineering**

## **Understanding Battery Degradation with a Data-Driven Approach**

In this presentation, Yuxun Ren will introduce a digital twin approach for sodium-ion batteries aimed at large-scale energy storage. This method enables real-time health monitoring and predictive performance assessment. Rapid diagnostics are combined with data-driven modeling. This framework offers early insight into battery aging and supports continuous tracking of battery conditions over time.

Yuxun Ren has been an assistant professor of materials science and engineering at the University of Central Florida since January 2025 and holds a joint appointment at the Resilient, Intelligent and Sustainable Energy Systems cluster (RISES). He obtained his doctorate in mechanical and aerospace engineering from the Hong Kong University of Science and Technology in 2019. From 2019 to 2023, he received postdoc training at Vanderbilt University, the University of Texas at Austin, and the University of Maryland, College Park. He also worked as a senior scientist in the battery industry from 2023 to 2024.