

THE UNIVERSITY OF GEORGIA  
DEPARTMENT OF STATISTICS

## Colloquium Series

3/21/2024

4:00 PM, Room 204, Caldwell Building

**Jin Lu**

Assistant Professor with School of Computing with UGA

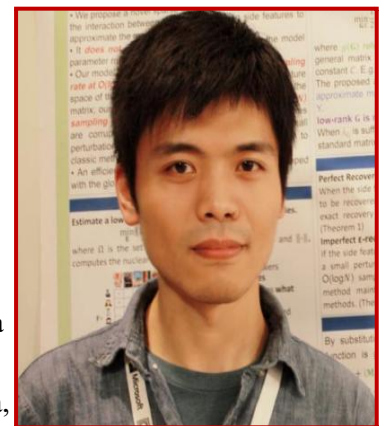
### **Provable Algorithms for Machine Learning in the Wild: Mobilizing, Hierarchizing, and Adaptive Morphing**

Amidst increasing data volumes, addressing large-scale machine learning challenges in environments characterized by inherent variability is crucial. Such variability impacts data collection, format, quality, computational capacity, and connectivity within cyber-physical systems, thereby shaping the development of resilient machine learning models across a wide array of high-impact applications. In dynamic environments, variability can manifest in several ways: (1) evolving network settings, with continuously changing topologies and reliability; (2) heterogeneous data sources and formats, featuring diverse data sample resources and formats as supplementary information; (3) limited computational power, where constraints and disparities in computational capacity hinder extensive model training and exacerbate unfairness.

This presentation will focus on environmental variability, highlighting recent efforts to develop theoretically robust machine learning approaches addressing these challenges with provable guarantees. The goal is to improve learning models by adapting them to adverse environments. We will examine three core methodological directions—mobilizing, hierarchizing, and adaptive morphing—alongside case studies, including federated learning and reinforcement learning using sensory data analysis.

#### **About the Speaker**

Jin Lu earned his Ph.D. in Computer Science and Engineering from the University of Connecticut. He is now an Assistant Professor in the School of Computing at the University of Georgia. Jin Lu's main research areas encompass machine learning and optimization, with a focus on tackling obstacles in large-scale machine learning in settings marked by inherent variability. His goal is to develop theoretically robust machine learning techniques with provable guarantees, enhancing learning models' adaptability to intricate environments. Jin Lu's research contributions span diverse fields such as health informatics, bioinformatics, community ecology, and sensory data analysis. His work has been published in esteemed conference proceedings and journals, including ICML, NeurIPS, UbiComp, BIBM, IEEE Transactions on Big Data, IOT-J, and System Biology. He actively engages as a program committee member and reviewer for global conferences and journals.



For more information, please contact us at:

Phone: 706.542.5232 E-Mail: [stat@uga.edu](mailto:stat@uga.edu)

Parking is available in the North Campus Parking Deck.

For a UGA Campus map, please see: <http://aviary.camplan.uga.edu/CampusMap/Default.aspx>