

UGA Statistics Colloquium Series

Dr. Yu Wang

Assistant Professor in the School of Computing and Institute for Artificial Intelligence at UGA

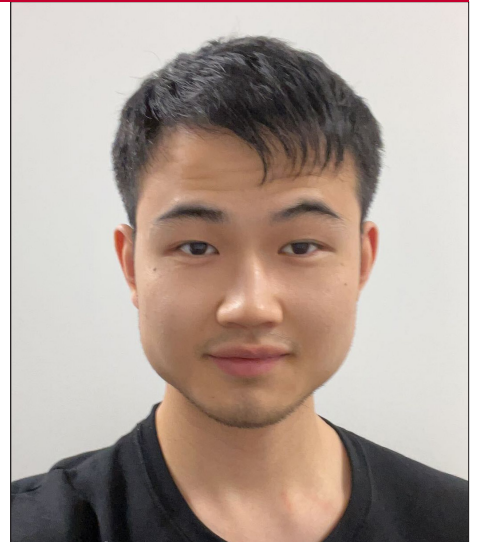
Thursday, Oct. 15, 2026, 4:30-5:30PM, Caldwell Rm. 204
Refreshments from 4:00-4:30pm in Cohen Room of Brooks

Harnessing the Power of Graphs to Structure Agentic Intelligence: Reasoning, Execution, and Applications

Abstract:

Agentic AI is rapidly transforming our daily lives and scientific research. Powered by advances in large language models (LLMs) and agent harness engineering, AI agents are increasingly capable of reasoning, planning, and orchestrating tools to tackle complex real-world tasks. However, real-world intelligence requires understanding and leveraging rich structural relationships, from social networks capturing human interactions to molecular graphs encoding chemical and protein interactions. These structures provide essential relational knowledge and domain constraints. How can we harness the power of graphs to infuse this structured knowledge into agentic intelligence for more effective and reliable reasoning and execution?

In this talk, I will present a graph-centered perspective on agentic intelligence across three interconnected directions: reasoning, execution, and applications. First, I will discuss how graphs enhance agent reasoning by modeling relational connections, incorporating domain-specific rules, and discovering latent structures when explicit rules are unavailable. Second, I will introduce our group recent work on unified graph abstraction for agentic workflows and execution, enabling systematic failure detection, diagnosis, and autonomous improvement. Finally, I will showcase two preliminary biomedicine applications from our group: graph agentic bioinformatics question answering and agentic molecular editing and design. Together, these efforts highlight the potential of graphs as a unifying foundation for building more reliable, interpretable, and adaptive agentic intelligence.



Bio: Yu Wang is an Assistant Professor in the School of Computing and Institute for Artificial Intelligence at the University of Georgia, where he directs the Knowledge Intelligence for Discovery and Decision-Making (KIND) Lab. His research spans machine learning, agentic AI, large language models, and graph-structured data, with an overarching vision of harmonizing structural and neural knowledge through structure-guided neural processing and neural-guided structure abstraction. His work aims to develop effective, trustworthy, and interpretable AI systems, with applications in social personalization and biomedicine. His research is supported by the National Science Foundation (NSF), including the CISE Core (III) program, and has been recognized with the ACM SIGKDD Best Dissertation Award Honorable Mention and the NeurIPS Graph Learning Frontiers Best Paper Award. He received his Ph.D. in Computer Science from Vanderbilt University and previously served as an Assistant Professor at the University of Oregon from 2024 to 2026.



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