

GEORGIA



Department of Statistics

UNIVERSITY OF GEORGIA

*Colloquium Series*

## Unlock Brain Architectures to Harness AI and Model Neurologic Diseases

When and Where:

9/12/2024

4:00 PM – 5:00PM

Room 204 Caldwell Hall

**Tianming Liu**



### Abstract:

The human brain is an intricate generative system that segregates, integrates, and executes diverse functions seamlessly. Unlocking and representing the brain's structural and functional architectures hold fundamental significance for neuroscience, healthcare of brain diseases, and brain-inspired artificial intelligence (AI), particularly generative AI (GenAI). This talk will present our pursuits in discovering the brain's organizational architectures, designing AI/GenAI neural networks grounded in these discovered brain science principles, functionally coupling human brains and AI/GenAI models, and understanding brain diseases through these new methodologies. Given the rapid strides in GenAI technology, it is envisioned that alignment and supervision of forthcoming superhuman GenAI systems by digital human brain models learned from massive human neuroscience data will be of paramount importance to our society, and accordingly, a technical roadmap will be laid out to computationally represent the human brain's functional and cognitive architecture and its temporally generative behaviors by a digital human brain, which will serve as the cornerstone for aligning and supervising future superhuman GenAI systems, as well as for individualized modeling and healthcare of human brain disorders.

### About the Speaker:

Dr. Tianming Liu is a Distinguished Research Professor and a Full Professor of Computer Science at The University of Georgia. Dr. Liu's research interests are brain imaging, computational neuroscience, brain-inspired artificial intelligence, and artificial general intelligence. Dr. Liu has published 400+ research papers on these topics, his Google citation is over 16,000+, and his H-index is 67. Dr. Liu is the recipient of NIH Career Award and NSF CAREER Award. Dr. Liu serves on the editorial boards of multiple international journals including IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Medical Imaging, Medical Image Analysis, IEEE Transactions on Cognitive and Developmental Systems, IEEE/ACM Transactions on Computational Biology and Bioinformatics, IEEE Reviews in Biomedical Engineering, and IEEE Journal of Biomedical and Health Informatics. Dr. Liu is a Fellow of AIMBE (American Institute of Medical and Biological Engineering) and was the General Chair of MICCAI 2019.