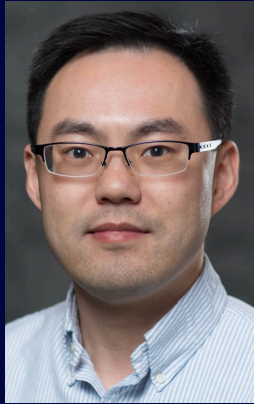


Department of Applied and Computational Mathematics and Statistics Colloquium



Rongjie Lai

Purdue University

Computational Mean-field Games: From Conventional Methods to Deep Generative Models

Mean field game (MFG) problems study how a large number of similar rational agents make strategic movements to minimize their costs. They have recently gained great attention due to their connection to various problems, including optimal transport, gradient flow, deep generative models, as well as reinforcement learning. In this talk, I will elaborate our recent computational efforts on MFGs. I will briefly discuss a low-dimensional setting, employing conventional discretization and optimization methods. Afterwards, I will discuss high-dimensional problems by bridging the trajectory representation of MFG with a special type of deep generative model - normalizing flows. This connection not only helps solve high-dimensional MFGs but also provides a way to improve the robustness of normalizing flows. Additionally, I will further extend the discussion to our recent work on supervised solution operator learning for MFG using transformers.

Mon, Oct. 7, 2024

3:45 – 4:45 PM

127 Hayes-Healy Center

Colloquium Tea – 3:15 PM in 101A Crowley Hall