## Statistics Seminar Department of Mathematics and Statistics

DATE:	Thursday, May 1, 2025
TIME:	1:15pm – 2:15pm
LOCATION:	WH 100E
SPEAKER:	Xinhai Zhang, Binghamton University
TITLE:	Neural Network Models in CATE Estimation

## **Abstract**

Estimating heterogeneous treatment effects has become increasingly important across empirical sciences. In this talk, I will present an overview of how neural network models have been applied to conditional average treatment effect (CATE) estimation. Motivated by the meta-learning framework, where treatment effect estimation is broken down into supervised learning sub-tasks, I will summarize key strategies based on plug-in estimation and pseudo-outcome regression. I will discuss how different neural network architectures have been designed or adapted for these strategies, and highlight their relative strengths and weaknesses. Throughout, I will connect theoretical insights to practical considerations, drawing on simulation studies that compare model performance under varying datagenerating conditions. The goal of the talk is to provide a structured understanding of the current landscape of neural network-based approaches to CATE estimation.

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