

Indiana University Indianapolis

Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, September 10, 2024

Zoom Meeting: Meeting ID: 845 0989 4694

Speaker: **Sohom Bhattacharya**

Department of Statistics, University of Florida

Title: **Causal effect estimation under network interference with mean-field methods**

Abstract:

In this talk, we will discuss efficient methods for causal effect estimation from observational data under interference. The interference pattern is captured by an observed network where interaction among the outcomes of distinct study units is captured through the graph structure. For “mean-field” interaction networks, we develop a new scalable iterative algorithm to estimate the causal effects. For gaussian weighted networks, we introduce a novel causal effect estimation algorithm based on Approximate Message Passing (AMP). We estimate the (unknown) parameters of the model from data using maximum pseudo-likelihood and establish consistency of this estimator in all parameter regimes. Finally, we prove that the downstream estimators obtained by plugging in estimated parameters into the aforementioned algorithms are consistent. Our algorithms originate from the study of variational inference approaches in high-dimensional statistics; overall, we demonstrate the usefulness of these ideas in the context of causal effect estimation under interference. This is a joint work with Dr. Subhabrata Sen.

Bio:

Dr. Sohom Bhattacharya is an Assistant Professor in the Department of Statistics, University of Florida. His work centers on the development of statistical methods under dependent data, with applications in network data analysis and causal inference under interference. Before joining the University of Florida, Dr. Bhattacharya did a postdoc in Department of Operation Research and Financial Engineering, Princeton University. Previously, he graduated from Department of Statistics, Stanford University.