Indiana University-Purdue University Indianapolis

Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, March 07, 2023
Zoom Meeting: Meeting ID: 845 0989 4694

Speaker: **Xia Wang**
Department of Mathematical Sciences,
University of Cincinnati

Title: **Hidden Markov Model in Multiple Testing on Dependent Data**

Abstract:

Multiple testing on dependent data needs to handle two basic modeling elements: the choice of distributions under the null and the non-null states and the modeling of the dependence structure across observations. A Bayesian hidden Markov model is constructed to handle these two issues. The proposed Bayesian method is based on the posterior probability of the null state and exhibits the property of an optimal test procedure, which has the lowest false negative rate with the false discovery rate under control. The model has either single or mixture distributions used under the non-null state, which can be flexibly modeled by ad-hoc model selection or the nonparametric Bayesian method. The proposed method is applied to both continuous and count data. We compared the proposed method with a collection of commonly used testing procedures to show its performance under different scenarios.

Bio:
Dr. Xia Wang is a professor of Statistics in the Department of Mathematical Sciences at the University of Cincinnati. Dr. Wang earned her doctoral degrees in statistics (2009) and economics (2007) from the University of Connecticut. Her research interests include Bayesian modeling of categorical data and scalable modeling of complex, high-dimensional data. Her research has been applied in the fields of biomedical studies, social sciences, ecological and environmental sciences, and climate change assessments.