

**Indiana University-Purdue University
Indianapolis**
Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, September 27, 2022
Zoom Meeting: Meeting ID: 845 0989 4694

Speaker: **Raymond Wong**
Department of Statistics, Texas A&M University

Title: **Combating Non-uniformity in Matrix Completion
through Weights**

Abstract:

Matrix completion is a modern missing data problem where the object of interest is a high-dimensional and often low-rank matrix. In this talk, I will discuss the application of weighting methods to deal with non-uniform missingness in matrix completion problems. I will highlight some unique challenges associated with inverse probability weighting (IPW)—a standard weighting approach—under matrix completion settings. Then I will introduce our most recent work on matrix completion under general non-uniform missing structures. We draw insight from covariate-balancing methods developed for treatment effect estimations and break away from the IPW framework. By controlling an upper bound of a novel balancing error, we construct weights that can actively adjust for the non-uniformity in the empirical risk without explicitly modeling the observation probabilities. The recovered matrix based on the proposed weighted empirical risk enjoys appealing theoretical guarantees. In particular, the proposed method achieves a stronger guarantee than existing work in terms of the scaling with respect to the observation probabilities, under asymptotically heterogeneous missing settings.

Bio:

Dr. Raymond Wong is an Associate Professor in the Department of Statistics, Texas A&M University, and an Executive Committee Member of the Research Institute for Foundations of Interdisciplinary Data Science (FIDS), funded by the NSF TRIPODS Initiative. He is also an Associate Editor of the Journal of Computational and Graphical Statistics, and the Awards Chair of both the ASA Section on Statistical Computing and the ASA Section on Statistical Graphics. Dr.

Wong got his PhD in Statistics from the University of California at Davis in 2014 and then he joined at Iowa State University as Assistant professor. In 2017 he moved to Texas A&M University. Dr. Wong's research interests focus on Causal Inference, Functional Data Analysis, Low-rank Modeling, Reinforcement Learning and Statistical Learning.