THE UNIVERSITY OF GEORGIA
DEPARTMENT OF STATISTICS

Colloquium Series

Thursday, March 2, 2023
4:00 PM, Room 204, Caldwell Building

Dr. Yingqi Zhao

Associate Professor, Fred Hutchinson Cancer Research Center

ESTIMATION AND INFERENCE ON HIGH-DIMENSIONAL INDIVIDUALIZED TREATMENT RULE IN OBSERVATIONAL DATA

With the increasing adoption of electronic health records, there is an increasing interest in developing individualized treatment rules (ITRs), which recommend treatments according to patients' characteristics, from large observational data. However, there is a lack of valid inference procedures for ITRs developed from this type of data in the presence of high-dimensional covariates. In this work, we develop a penalized doubly robust method to estimate the optimal ITRs from high-dimensional data. We propose a split-and-pooled de-correlated score to construct hypothesis tests and confidence intervals. When the non-differentiable loss is employed, we further propose a kernel-smoothed decorrelated score, where we adopt kernel approximations to smooth the discontinuous gradient near discontinuity points and approximate the non-regular Hessian of the surrogate loss. We establish the limiting distributions of the split-and-pooled de-correlated score test and the corresponding one-step estimator in high-dimensional setting. Simulation and real data analysis are conducted to demonstrate the superiority of the proposed method.

About the Speaker

Dr. Yingqi Zhao is an Associate Professor in the Fred Hutchinson Cancer Research Center in Washington, Seattle. She received her PhD in biostatistics from the University of North Carolina, Chapel Hill in 2012. In 2018 she received the SWOG Coltman Fellowship early-career award. With the goal of improving patient outcomes, Dr. Yingqi Zhao's work focuses on developing novel statistical and machine learning methods for personalized medicine, dynamic treatment regimes, disease screening and surveillance, clinical trial design, and electronic health records.

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