ACMS Statistics Seminar

Sriram Somanchi
University of Notre Dame

Tues, March 7, 2017
154 Hurley Hall
4:00 – 5:00 PM

Detecting Heterogeneous Treatment Effects in Patient Care using Anomalous Pattern Detection

Patient care data, such as Electronic Health Records (EHR) and health insurance claims, create a unique opportunity to improve clinical practice by analyzing patterns across patients and providing actionable insights.
This work provides a methodology to identify subpopulations for whom certain patterns of medical care have led to significantly anomalous health outcomes. We provide a general framework to identify these anomalous patterns of care and provide an empirical analysis using health insurance data. We detect interventions in patient care (currently in terms of medications) that have significantly affected health outcomes either negatively (in which case they may represent suboptimal care that should be identified and corrected) or positively (in which case they may represent new, previously undiscovered best care practices). This will further help both in terms of improving patient health and reducing health care costs. The methodological contributions of this work are in developing novel machine learning methods to identify heterogenous treatment effects from observational data. This is an important and challenging problem which is more generally applicable to statistics, medical and social science literature.