Speaker: Azeem Shaikh, University of Chicago

Title: Inference for Partially Identified Models

Abstract:

We study the problem of inference in partially identified models, i.e., models in which the parameter of interest is not uniquely determined by the distribution of the observed data, \( P \in \mathcal{P} \). The class of models considered are defined by a population criterion function \( Q(\theta, P) \) for \( \theta \in \Theta \). Unlike the classical extremum estimation framework, it is not assumed that \( Q(\theta, P) \) has a unique minimizer in the parameter space \( \Theta \). We study two distinct definitions for confidence regions in this setting. In the first formulation, the object of interest is some unknown point \( \theta \in \Theta_0(P) \), where \( \Theta_0(P) = \arg \min_{\theta \in \Theta} Q(\theta, P) \), and so random sets that contain each \( \theta \in \Theta_0(P) \) with at least some pre-specified probability asymptotically are desired. In the second formulation, the object of interest is \( \Theta_0(P) \) itself, and so random sets that contain this set with at least some pre-specified probability asymptotically are desired. Building upon general results on the uniform asymptotic validity of subsampling, constructions of confidence regions satisfying these coverage requirements that are uniformly consistent in level under weak assumptions on \( P \) are described. We conclude with an application to inferring the effect of Swan–Ganz heart catheterization on mortality using observational data.

This talk will draw upon joint work with Jay Bhattacharaya (Stanford University), Joseph Romano (Stanford University), and Edward Vytlacil (Yale University).