

**“Doubly robust approaches to high-dimensional causal** **inference”**

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# Abstract

Valid estimation of treatment effects from observational data requires proper control of confounding. If the number of covariates is large relative to the number of observations, then controlling for all available covariates is infeasible. In this talk, I will discuss two projects aimed at estimating treatment effects when some form of dimension reduction or variable selection is required. The first portion of the talk will focus on matching estimators that utilize a high-dimensional propensity and prognostic score. We will show that matching on both quantities leads to an estimator that is doubly robust, and that matching on both scores greatly improves inference over simply matching on one or the other. In the second portion of the talk, we will discuss a different doubly robust estimator that is based on Bayesian semiparametrics. We will show that it is more widely applicable than the first estimator, and that it is well suited to provide valid inference in small sample sizes by combining posterior samples with an efficient resampling procedure. I will provide theoretical justification for the aforementioned procedure, and I will illustrate its use through simulation and an analysis of continuous environmental exposures.

# 12:00 Noon, Tuesday, February 11, 2020

# 47 College Street, 106B

# 11:45 AM Lunch served outside Rm. 106B

