Overview and Objectives

Econ 2148, one of the second-year econometrics field classes, will cover several topics:

1. *The “structural” vs. “causal” polemic:*
   The course will open with a review of the recent debates in microeconometrics between the proponents of so-called “reduced form” and those of “structural” approaches. The rest of the course will then discuss contributions that should allow you to take a reasoned position about the validity and relevance of the various arguments made.

2. *“What can we get” – Nonparametric identification:*
   In the second part of the course we will discuss how some of the most common approaches in microeconometrics (instrumental variables, difference in differences, regression discontinuity) can be interpreted in and generalized to settings without functional form assumptions.

3. *Bayesian decision theory and Bayesian nonparametrics:*
   In the third part of class, we will discuss Bayesian estimation. We will review the decision-theoretic foundations of Bayesian estimation, the frequentist properties of Bayesian estimators, and recent advances in nonparametric Bayesian methods.
4. “What do we want” – Optimal policy, Parameters of interest, and distributional policy evaluation:
   The fourth part of class will cover recent contributions that analyse the dependence of parameters of interest on policy objectives and constraints. We will furthermore look at articles discussing inference on the effect of policies on unconditional outcome distributions.

5. Experiments and experimental design:
   A final topic that we might cover is experimental design - How should we analyze data from randomized experiments? How should we use prior information and baseline covariates to assign treatments? How does experimental design relate to economic theory?

This is a paper-based class. We will read about three papers per week. We might not be able to cover all papers included in this Syllabus; we will discuss in our first class which topics to emphasize. I have posted all papers we will read on the class site. All of you are required to upload brief verbal summaries of every week’s readings before class starts on Wednesday. One of you will always be in charge of first giving a brief presentation on one of the papers, and then guiding the discussion about that paper. I will of course be prepared to help in directing the discussion, and to answer any questions that might come up (I’m sure there will be many, and you should not hesitate to ask). I will also occasionally distribute handouts that give an overview of some topics.

Requirements and policies

Please sign up during our first class for the papers for which you will be in charge of preparing a presentation and guiding the discussion. Everyone has to sign up for 3 papers, assuming that there are about 12 students in the class. Sign-up starts on January 31.

Please upload your summaries of this week’s readings before class starts every Wednesday. You are allowed to miss up to two summaries without a negative impact on your grade.

Your grade will be based upon

1. Your summaries (25% of grade).

2. Your presentations and direction of discussions (40% of grade).

3. An in-class final exam on April 29 (35% of grade).
To help me improve the course, I will ask you to give me anonymous feedback at some point, writing what you like about the class and what you think I should change.
I encourage you to come to office hours with any questions. I will not answer emails with questions on the material.
If you need any special accommodations for physical or medical reasons, please see me after class or send me an email.

1 Warm up

The “structural” vs. “causal” polemic

- Critique of the (quasi) experimental literature
  

- Defense
  

- Praise of the (quasi) experimental literature
  

- Counter
  
2 What can we get? Nonparametric identification

Instrumental variables - binary case

• LATE - nonparametric reinterpretation of linear IV


• Partial identification of the ATE under minimal assumptions


Instrumental variables - continuous case

• Conditional moment restrictions – 1 dimensional heterogeneity in structural equation


• Control functions – 1 dimensional heterogeneity in first stage

• Unrestricted heterogeneity


**Panel data**

• Partial identification under minimal assumptions


• Adding a linear random coefficient assumption


**Regression discontinuity**


3 Bayesian decision theory and Bayesian nonparametrics

• Statistical decision theory and Bayesian methods


• Frequentist properties of parametric Bayesian estimators

Nonparametric priors

- Dirichlet priors
  

- Gaussian process priors
  

- The theory of reproducing kernel Hilbert spaces
  
  

4 What do we want? Parameters of interest

Optimal policy and parameters of interest

- Treatment effects versus the welfare impact of treatment assignment policies
  
  

- Envelope arguments and the welfare impact of policies
  
  
• Combining statistical decision theory and optimal policy theory

• Linear budget constraints and the irrelevance of average effects

Distributional policy evaluation

• The classic reference

• Marginal policy changes and unconditional outcome distributions

• Kernel inference on distributional policy effects under conditional independence

• Partial identification of distributional policy effects

5 Experiments and experimental design

• Estimation
• Rerandomization


**Optimal experimental design**

• Review of the classical theory of optimal experimental design


• A nonparametric, decision theoretic perspective


**Experiments that test theories**

• Literature review


• Distinguishing moral hazard and adverse selection


• Neoclassical separable time preferences versus reference dependence