Lecture: TTh 1:30-3:20, KGH 3301

Instructor: Ivan Canay

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Course Description: This course is the second quarter in the graduate econometrics sequence. It is divided in four parts. Part I presents different notions of asymptotic optimality of tests and estimators. Part II covers the topic of uniformly valid inference, with an emphasis on inference in moment inequality models. Part III discusses methods for assigning units into treatment and control in randomized controlled experiments, and studies inference on the average treatment effect in experiments involving covariate-adaptive randomization. Finally, Part IV presents recent methods for inference with few heterogeneous clusters.

Grading: Grading will consist on weekly reports (submitted via Canvas), a problem set due Friday May 25th, and research proposal due on Thursday June 14th. The problem set will be available on May 14th and it will consist of theoretical questions and empirical/methodological questions. Weekly reports should avoid displays and formulas and be limited to a maximum of two pages. Finally, the research proposal should consist of 3-5 pages and explain the main research question and how the question relates to the existing literature. The weighting scheme for the final grade will be:

Weekly Reports: 30%  
Problem set: 30%  
Research Proposal: 40%

Lecture Notes: I will provide lecture notes every week with related references you are supposed to read. The readings listed below include most of the articles we will discuss in class.

Important Dates: There is no class on May 24th. Last class is on June 7th.
AccessibleNU: Any student requesting accommodations related to a disability or other condition is required to register with AccessibleNU (847-467-5530) and provide professors with an accommodation notification from AccessibleNU, preferably within the first two weeks of class. All information will remain confidential.

Course Outline

Part I: Understanding Asymptotic Approximations

1. Local Asymptotics
2. Extrapolating Local Power
3. Large Deviations
4. Contiguity
5. Local Asymptotic Normality
6. Convolution Theorems

Part II: Uniformity and Inference with Moment Inequalities

7. The Bahadur-Savage Problem
8. Uniformity of the $t$-test
9. Uniformity of Subsampling
10. Moment Inequality Models I
11. Moment Inequality Models II

Part III: Treatment Assignment and Inference in RCEs

12. The Treatment Assignment Problem
13. Restricted Randomization: Permutted Blocks and Bias Coin Design
14. Stratification and Covariate-Adaptive Randomization
15. Inference under Covariate-Adaptive Randomization I
16. Inference under Covariate-Adaptive Randomization II
Part IV: Inference with Few Clusters

17. Inference with Few Clusters I
18. Inference with Few Clusters II

Readings


