Nihal Mehta

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Education

Ph.D. Economics, The Pennsylvania State University, 2019-2025 (expected)

Committee: Keisuke Hirano (co-chair), Andres Aradillas-Lopez (co-chair), Patrik Guggenberger

M.A. Economics, Delhi School of Economics, 2015-2017

B.A. (Honors) Economics, University of Delhi, 2012-2015

Research Interests

Econometrics, Health Economics, Machine Learning, Empirical IO

Working Papers

"Anatomy of a Firm: Constraints and Sparsities Based on the Economics of Production" **(Job Market Paper)**

Abstract: The Covid-19 pandemic severely disrupted the nursing home industry, with understaffing identified as a major reason for the inadequate provision of care. In response, the Centers for Medicare & Medicaid Services (CMS) recently introduced a minimum staffing mandate to be implemented nationwide over the next five years. This policy, like many real-world interventions, is nuanced: it targets specific worker types while allowing firms some flexibility in substituting between different workers to meet an overall staffing threshold. A crucial metric for evaluating such a policy is the counterfactual labor demand - how nursing homes adjust their staffing mix in response to the policy. Estimating this metric accurately necessitates a disaggregated analysis of production inputs while maintaining sufficient flexibility to capture complex substitution patterns. Drawing on the theories of personnel economics and organizational design, we propose a novel high-dimensional model of team-based production, incorporating economically interpretable restrictions and sparsities. We develop a shape-constrained and group-LASSO penalized GMM estimator for implementation, made computationally feasible by leveraging state-of-the-art neural network algorithms.

"Robust Nonparametric Testing of Conditional Independence"

Abstract: Testing for equality between two conditional probability functions can show up in a wide variety of economic settings. When covariates are high dimensional or continuous, we propose discretization of the covariate space as the tuning parameter in the contingency table approach to testing. Through Monte Carlo simulations, we observe that it has superior size control and power against alternatives while being robust to choice of the tuning parameter compared to testing based on series estimation. We show that testing for racial bias in judicial decisions reduces to a test of equality of conditional recidivism probabilities across races under certain assumptions. We apply this framework to parole decisions in the state of Georgia and find evidence of racial bias.

"Minimax Regret Treatment Rules with Finite Samples when a Quantile is the Object of Interest"

(with Patrik Guggenberger and Nikita Pavlov)

Consider the setup in which a policymaker is informed about the population by a finite sample and based on that sample has to decide whether or not to apply a certain treatment to the population. We work out finite sample minimax regret treatment rules under various sampling schemes when outcomes

are restricted onto the unit interval. In contrast to Stoye (2009) where the focus is on maximization of expected utility the focus here is instead on a particular quantile of the outcome distribution. We find that in the case where the sample consists of a fixed number of untreated and a fixed number of treated units, any treatment rule is minimax regret optimal. The same is true in the case of random treatment assignment in the sample with any assignment probability and in the case of testing an innovation when the known quantile of the untreated population equals $1/2$. However if that quantile exceeds $1/2$ then never treating is the unique optimal rule and if it is smaller than $1/2$ always treating is optimal. We also consider the case where a covariate is included

Employment

Graduate Research Assistant

Keisuke Hirano, Summer 2023 - Present

Patrik Guggenberger, Summer 2022

Andres Aradillas-Lopez, Summer 2020

Experienced Associate, PricewaterhouseCoopers (PwC) US Advisory, Mumbai, Jul. 2017 - Jun. 2019

Analytics Intern, Standard Chartered Bank, Bengaluru, Summer 2016

Teaching

Graduate Teaching Assistant, The Pennsylvania State University

Introductory Econometrics, Honors (undergraduate), Spring 2023
Money and Banking (undergraduate), Fall 2022
Introductory Econometrics (undergraduate), Spring 2022
Introductory Macroeconomic Analysis and Policy (undergraduate), Fall 2020, Spring 2021, Fall 2021

Instructor, Introductory Microeconomics, The Pennsylvania State University, Summer 2021

Honors and Awards

Graduate Economics Scholarship, Penn State, 2019-2025

Merit Scholarship, Delhi School of Economics, 2015 - 2017

First Rank, Dyal Singh College, University of Delhi, 2012 - 2015

Languages and Skills

Computer Skills: Julia, Python, R, Matlab, Stata, Latex, Git, Slurm

Languages: English (fluent), Hindi (native), Punjabi (basic)

References

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