Filip Obradović

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Northwestern Economics

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Fields

Econometrics, Applied Econometrics

Education

Ph.D., Economics, Northwestern University — 2025 (anticipated)
Committee: Charles Manski (Co-chair), Ivan Canay (Co-chair), Federico Bugni

M.A., Economics, Northwestern University — 2020

M.Sc., Quantitative Finance, University of Belgrade — 2019

M.Sc., Econometrics, University of Belgrade — 2018

B.Sc., Economics (with honors), University of Belgrade — 2015

Fellowships & Awards

Robert Eisner Memorial Fellowship — 2022–2023

Distinguished Teaching Assistant Award — 2021

Unicredit Crivelli Fellowship — 2019–2021

Northwestern Graduate Fellowship — 2019–2020

Best Student in Economics, University of Belgrade — 2014, 2015, 2016

Foundation for Young Talents "Dositeja" Scholarship — 2014–2015

Serbian Academy of Arts and Sciences Scholarship — 2013–2014

Ministry of Education of R. of Serbia Scholarship — 2012–2015

Award for Exceptional Dedication, Red Cross of Serbia — 2014

Teaching Experience

Course Instructor, Northwestern University — 2022
Econometrics Review for Incoming Ph.D. Students

Teaching Assistant, Northwestern University — 2020–2022
ECON 480-1 Graduate Econometrics
MMSS 311-2 Mathematical Methods in the Social Sciences
MATH 385 Probability and Statistics

Teaching Assistant, LSE & University of Belgrade — 2018
EC2020 Elements of Econometrics

Teaching Assistant, University of Belgrade — 2015–2018
Time Series Analysis
Econometrics
Introduction to Econometrics

Research Experience

Research Assistant, Prof. Charles Manski, Northwestern University — 2021–present

Research Assistant, Deutsche GIZ — 2017–2019

Presentations

Econometrics Junior Conference, Notre Dame — 2024

Annual Health Econometrics Workshop, Emory University — 2022

Econometrics Seminar, Northwestern University — 2021

Refereeing JBES, JPE: Micro

Job Market Paper **"Long-Term Treatment Effect Identification via Data Combination"**

Abstract: Coming soon.

Publications **"Measuring Diagnostic Test Performance Using Imperfect Reference Tests: A Partial Identification Approach"**

Journal of Econometrics, Volume 244, Issue 1

Abstract: Diagnostic tests are almost never perfect. Studies quantifying their performance use knowledge of the true health status, measured with a reference diagnostic test. Researchers commonly assume that the reference test is perfect, which is often not the case in practice. When the assumption fails, conventional studies identify "apparent" performance or performance with respect to the reference, but not true performance. This paper provides the smallest possible bounds on the measures of true performance - sensitivity (true positive rate) and specificity (true negative rate), or equivalently false positive and negative rates, in standard settings. Implied bounds on policy-relevant parameters are derived: 1) Prevalence in screened populations; 2) Predictive values. Methods for inference based on moment inequalities are used to construct uniformly consistent confidence sets in level over a relevant family of data distributions. Emergency Use Authorization (EUA) and independent study data for the BinaxNOW COVID-19 antigen test demonstrate that the bounds can be very informative. Analysis reveals that the estimated false negative rates for symptomatic and asymptomatic patients are up to 3.17 and 4.59 times higher than the frequently cited "apparent" false negative rate. Further applicability of the results in the context of imperfect proxies such as survey responses and imputed protected classes is indicated.

Other Papers **"Identification and Inference on Treatment Effects under Covariate-Adaptive Randomization and Imperfect Compliance"** with **Federico Bugni**, **Mengsi Gao**, and **Amilcar Velez**.

Abstract: Randomized controlled trials (RCTs) frequently utilize covariate-adaptive randomization (CAR) (e.g., stratified block randomization) and commonly suffer from imperfect compliance. This paper studies the identification and inference for the average treatment effect (ATE) and the average treatment effect on the treated (ATT) in such RCTs with a binary treatment. We first develop characterizations of the identified sets for both estimands. Since data are generally not i.i.d. under CAR, these characterizations do not follow from existing results. We then provide consistent estimators of the identified sets and asymptotically valid confidence intervals for the parameters. Our asymptotic analysis leads to concrete practical recommendations regarding how to estimate the treatment assignment probabilities that enter in estimated bounds. In the case of the ATE, using sample analog assignment frequencies is more efficient than using the true assignment probabilities. On the contrary, using the true assignment probabilities is preferable for the ATT.

"On the Power Properties of Inference for Parameters with Interval Identified Sets" with **Federico Bugni**, **Mengsi Gao**, and **Amilcar Velez**.

Abstract: This paper studies the power properties of confidence intervals (CIs) for a partially-identified parameter of interest with an interval identified set. We assume the researcher has bounds estimators to construct the CIs proposed by Stoye (2009), referred to as CI_α^1, CI_α^2, and CI_α^3. We also assume that these estimators are "ordered": the lower bound estimator is less than or equal to the upper bound estimator.
Under these conditions, we establish two results. First, we show that CI_α^1 and CI_α^2 are equally powerful, and both dominate CI_α^3. Second, we consider a favorable situation in which there are two possible bounds estimators to construct these CIs, and one is more efficient than the other. One would expect that the more efficient bounds estimator yields more powerful inference. We prove that this desirable result holds for CI_α^1 and CI_α^2, but not necessarily for CI_α^3.

"Binary Classifiers as Dilations" with **Gabriel Ziegler**.

Abstract: Seidenfeld and Wasserman (1993) define the phenomenon of *dilation*. When a dilation occurs, any additional information *increases* the *uncertainty* about the true state of the world. In this paper, we show that dilation may manifest in real-world scenarios when information is provided by binary classifiers, such as diagnostic tests and predictive algorithms. This can happen when classifier performance measures are partially identified due to an imperfect reference classifier, which are ubiquitous in practice. We characterize when a dilation occurs and develop corresponding inference procedures based on methods for subvector inference in moment inequality models. We apply the approach to diagnostic procedures for COVID-19 detection, using CT chest scans evaluated by radiologists and AI algorithms. We cannot reject the hypothesis that the radiologists' assessments exhibit a dilation, thus showcasing a potential real-world instance of a dilation. We additionally illustrate the broader applicability of our methodology by rejecting the hypothesis that data-mining techniques for predicting the riskiness of credit card applications are non-informative in the sense of a dilation.

"Using Baseline Data to Guide Experimental Design"

Abstract: Randomized controlled trials (RCTs) are costly. Designs with optimal treatment assignment probabilities — the Neyman allocation — may provide more powerful inference for a fixed sample size. Work implementing such designs usually relies on pilot data which are rarely available in practice. However, availability of baseline outcome and treatment data is common. I pose the experimental design as a decision problem and show how baseline data may be used to inform it. This yields the minimax and minimax regret optimal assignment probabilities that result in asymptotic variances that are minimax and minimax regret optimal under a large class of assignment mechanisms, including stratified block randomization. I illustrate the utility of the findings using empirically calibrated simulations.

Medical Research

"Comparing the Cost of Cirrhosis to Other Common Chronic Diseases: A Longitudinal Study in A Large National Insurance Database" with NUTORC (First Author)

Resubmitted to *Hepatology*

Languages

English (fluent), Serbian/Croatian/Bosnian (native), Swedish (intermediate), German (basic)

References

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