Kirill Ponomarev

Contact Information

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References

Rosa Matzkin	matzkin@econ.ucla.edu
Andres Santos	andres@econ.ucla.edu
Denis Chetverikov	chetverikovdenis@gmail.com

Education

Ph.D. in Economics, University of California, Los Angeles, 2016−present (expected June 2022)
Advisors: Rosa Matzkin, Andres Santos

B.S. in Economics, *summa cum laude*, Higher School of Economics, Moscow, Russia, 2012−2016
Major: Mathematical Economics

Fields

Primary: Econometrics
Secondary: Industrial Organization, Economic Theory

Research

Working Papers:

- **Efficient Estimation of Directionally Differentiable Functionals (Job Market Paper)**
  This paper studies estimation of the parameters of the form $\phi(\theta_0)$, where ϕ is a known directionally differentiable function and θ_0 is an unknown but estimable parameter. Such $\phi(\theta_0)$ may represent, for example, the identified set (i.e., the lower and upper bounds) for a parameter of interest in a partially identified model. Under minimal assumptions on the function ϕ or the class of competing estimators, I develop efficient (Locally Asymptotically Minimax) estimators for such parameters. Specifically, I show that the efficient estimator for $\phi(\theta_0)$ takes a simple form $\phi(\hat{\theta}_n + \hat{v}_{1,n}) + \hat{v}_{2,n}$ where $\hat{\theta}_n$ is the efficient estimator for θ_0, and $\hat{v}_{1,n}, \hat{v}_{2,n}$ are adjustment terms that can be computed from the data. Importantly, the optimal adjustment terms depend on the choice of the loss function, meaning that it should be tailored to specific applications. A simulation study suggests that the proposed estimator performs well in small samples, relative to the existing alternatives. As an empirical illustration, I apply the developed theory to estimate the bounds on the distribution of valuations and the optimal reserve price in English auctions with independent private values.

- **Selecting Inequalities for Identification in Finite Games**
  The empirical analysis of finite games (i.e., games with a finite number of possible outcomes) is complicated by the multiplicity of equilibria. Typically, unless the researcher is willing to assume a specific equilibrium selection mechanism, the underlying structural parameters of the game are only

partially identified. The recent literature has developed methods for constructing sharp identified sets for such parameters, which are typically defined by a large number of moment inequalities. However, even in games with a relatively small number of players, checking all inequalities may be computationally infeasible. This paper develops a more practical characterization by identifying the smallest subset of the inequalities that guarantees sharpness. This subset is entirely determined by the structure of the game (i.e., payoff functions and the notion of equilibrium) and can be efficiently computed using graph propagation algorithms. The proposed characterization is shown to substantially simplify identification, estimation, and inference in a class of finite games. Moreover, in the settings where checking even the smallest set of inequalities is computationally infeasible, the result can inform inequality selection to avoid substantial information losses.

– **Peer Effects in Endogenous Networks with Positive Spillovers**

This paper studies a class of network games in which each player chooses both an activity level and a set of connections, and the activity levels of different players are complementary. Examples include peer effects in education, criminal activity, labor market participation, or R&D collaboration. Under reasonable restrictions on payoffs, positive externalities in activity levels induce strong complementarity over links: When a particular link is added to the network, the marginal utility of every other link increases. This powerful property allows for a tractable analysis of games with many heterogeneous players. The contribution of this paper is twofold. First, I provide a novel characterization of the equilibrium (Pairwise Nash Stable) networks, activity levels, and welfare distribution. Assuming that players have different types, defined by the linking cost and ex-ante ability level, I show that the equilibrium networks consist of several interlinked components with simple structures. Each component is formed by players of the same type so that more connected players exhibit higher activity levels and receive higher payoffs. The resulting network structures closely resemble weakly connected and highly centralized networks observed in the data. Second, I discuss the implications of the above results for empirical analysis and construct identified sets for the payoff parameters that remain tractable in networks of moderate size. A simulation study reveals that the proposed identified sets can be sufficiently informative.

Publications (prior to Ph.D.)

– "From Correlation to Causation: Econometric vs Computer Science Approaches"
HSE Economic Journal, 19(3) (2015) pp. 457-496 (in Russian, with N. Arefiev and S. Kuznetsov)

Teaching Experience

Instructor:

– Statistics for Economists (undergraduate), UCLA 2019−2021

Teaching Assistant:

– Introduction to Econometrics (first-year Ph.D. sequence), UCLA 2018−2020

– Summer Preparation Course (masters) Anderson School of Management, UCLA 2019−2020

– Statistics for Economists; Introduction to Econometrics (undergraduate), UCLA 2017−2020

– Linear Algebra; Probability and Statistics; Econometrics (undergraduate), HSE 2013−2016

Fellowships and Awards

Graduate Dissertation Year Fellowship, UCLA	2021−2022
Best Proseminar Paper Award, Department of Economics, UCLA	2020
TA Awards for Outstanding Performance, Department of Economics, UCLA	2018−2021
Graduate Summer Research Mentorship Award, UCLA	2017
Department of Economics Fellowship, UCLA	2016−2017

Seminars and Conferences

2021 University of California Los Angeles, Bristol Econometric Study Group

Skills

Software: R, Julia, Python, Stata, Git

Languages: English (fluent), Russian (native)