Kirill Ponomarev

Contact Information

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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 parameters of the form $\phi(\theta_0)$, where ϕ is a known directionally differentiable function, and θ_0 is an estimable feature of the observed distribution of the data. Such parameters are abundant in econometric models and typically take the form of maxima or minima of some estimable objects. Examples include bounds on the average treatment effects in non-experimental settings, identified sets for the coefficients in regression models with interval-valued data, bounds on the distribution of wages accounting for selection into employment, and many others. I show that the efficient (Locally Asymptotically Minimax) estimators for such parameters take the 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 suitable adjustment terms. I demonstrate that the optimal adjustment terms depend on the chosen loss function and develop a general procedure to compute them from the data. A simulation study shows that the proposed estimator can have lower finite-sample bias and variance than the existing alternatives. As an application, I construct efficient estimators for the bounds on the distribution of valuations and the optimal reserve price in English auctions with independent private values. Empirically calibrated simulations show that the resulting estimates are substantially sharper than the previously available ones.

- **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 exhibit positive spillovers. Examples include peer effects in education, labor market participation, criminal activity, and R&D collaboration. The contribution of this paper is twofold. First, I provide a detailed characterization of the equilibrium (Pairwise Nash Stable) networks, activity levels, and welfare distribution. Importantly, I allow for heterogeneous players with different types, defined by ex-ante ability level and linking costs, and

do not impose strong separability restrictions on payoffs. I show that the equilibrium networks consist of several interlinked components with simple structures: each component contains central and peripheral players of the same type; central players of different types may be interlinked; within each type, central players exhibit higher activity levels and receive higher payoffs. The resulting network structures closely resemble the asymmetric and weakly connected 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 suggests that the proposed identified sets can be sufficiently informative.

- **Selecting Inequalities for Sharp Identification in Models with Set-Valued Predictions**

  Many partially identified models have the following structure: given a parameter vector and covariates, the model produces a set of predictions while the researcher observes a single outcome. Examples include entry games with multiple equilibria, network formation models, discrete-choice models with endogenous explanatory variables or heterogeneous choice sets, and auctions. Sharp identified sets for structural parameters in such models can be characterized via Artstein's inequalities. For a given parameter value, the inequalities verify that the observed conditional distribution of outcome given covariates belongs to the set of distributions admitted by the model (called the core). However, checking all inequalities is often computationally infeasible, so one must select a subset thereof (e.g., a core-determining class). This paper offers guidance for inequality selection in such settings. I propose a new criterion that dramatically reduces the number of inequalities without loss of information and applies both in the population and in finite samples. In settings where the outcome space is finite, I derive the smallest subset of the inequalities that guarantees sharpness, which can be efficiently computed using graph propagation techniques. I illustrate the utility of the proposed criterion in the context of market entry games, network formation models, and auctions.

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 UCLA, Bristol Econometric Study Group

Skills

Software: R, Julia, Python, Stata, Matlab, Git

Languages: English (fluent), Russian (native)

References

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