Zheng (Lucas) Zhang

Department of Economics, University of California, Los Angeles
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Education

Ph.D. in Economics, University of California, Los Angeles, June 2023 (Expected)

- Fields: Econometrics, Applied Economics
- Advisors: Andres Santos (co-chair), Denis Chetverikov (co-chair), Rosa Matzkin

B.A. in Economics, University of California, Berkeley, May 2017

- Highest Honor in Economics (honor thesis advised by Joseph Farrell)
- Highest Distinction in General Scholarship

Job Market Paper

◇ "High-Dimensional Conditional Density Estimation and Continuous Difference-in-Differences" [Link]

Abstract: Conditional density enjoys a series representation, with each term being a known function multiplied by its conditional expectation. This structure is especially beneficial in high-dimensional settings, where these conditional expectations can be flexibly estimated using various machine learning methods. However, choosing the right series terms is challenging. We introduce a data-driven estimator using a cross-validation procedure and demonstrate its optimality through an oracle inequality that bounds the estimation error. Beyond our theory-backed estimation strategy, we underscore the extensive role of conditional density in economics, especially as the generalized propensity score in causal inference with continuous treatment. Furthering this discourse, we extend the widely-used difference-in-differences models to accommodate continuous treatment. Specifically, we establish identification, estimation, and inference results for the causal parameter of interest under the double/debiased machine learning framework. To illustrate the practicality of our methods, we revisit two notable empirical studies: Acemoglu and Finkelstein (2008) on technological innovation in U.S. healthcare industries, and Duflo (2001) on a large-scale policy intervention in Indonesia.

Working Papers

◇ "Approximate Sparsity Class and Minimax Estimation"

Abstract: Motivated by the orthogonal series estimation for densities in $L^2([0,1],\mu)$, in this project we consider a new class of functions that we call the approximate sparsity class. This new class is characterized by the rate of decay of the individual Fourier coefficients for a given orthonormal basis. We establish bounds on the $L^2([0,1],\mu)$ metric entropy of such class, with which we establish the minimax rate of convergence. For the density subset in this class, we propose an adaptive density estimator based on hard-thresholding that achieves this minimax rate up to a log term.

Teaching

Instructor

- Intro Econometrics, Summer 2020, 2021, 2022 (Undergraduate, UCLA)

Teaching Assistant

- Intro Econometrics; Intermediate Micro; Pricing and Strategy (Undergraduate, UCLA)
- Econometrics: Linear Models and Nonparametric Methods (PhD Courses, UCLA)

Service and Experience

Research Assistant

- UCLA: Winter 2019-2022; Summer 2023
  Reference(s): Denis Chetverikov, Zhipeng Liao, Rosa Matzkin
- UC Berkeley: 2016-2017
  Reference(s): Joseph Farrell, Yuriy Gorodnichenko

Teach Assistant Consultant, UCLA Economics Department, 2021-2023

- Co-facilitate with the vice chair on the development and training of new TAs;
- Support TAs in the department through consultation, observations, and providing feedback.

Honors and Awards

UCLA

- Proseminar Award, Econometrics, 2022
- Dissertation Year Fellowship, 2022-2023
- Distinguished TA Award, 2018, 2020, 2021, 2022
- Graduate Summer Research Mentorship (GSRM), 2019
- University Fellowship, 2017-2018

UC Berkeley

- Phi Beta Kappa, 2017
- Berkeley Club of Hong Kong Scholarship, 2017
- International Student Tuition Grant, 2017
- URAP Summer Research Award, 2016

References

Andres Santos (Co-Chair)	Denis Chetverikov (Co-Chair)	Rosa Matzkin
Department of Economics	Department of Economics	Department of Economics
UCLA	UCLA	UCLA
andres@econ.ucla.edu	chetverikov@econ.ucla.edu	matzkin@econ.ucla.edu

Others

English; Mandarin Chinese; on F-1 Visa

Python; R; MATLAB; Stata; LaTeX