Lucas (Zheng) Zhang

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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

- Advisors: Joseph Farrell, Yuriy Gorodnichenko
- Highest Honor in Economics
- Highest Distinction in General Scholarship

Job Market Paper

◇ "Cross-Validated Conditional Density Estimation and Nonparametric Continuous Difference-in-Differences Models" [Link]

Abstract: In this paper, we study the conditional density estimation based on a representation using the orthonormal series expansion. In this series representation, each term takes the form of a multiplication of the basis term and its conditional expectation. For high-dimensional conditioning variables with suitable structures, these conditional expectations can be estimated using various machine learning methods. We propose a data-driven method of selecting the series terms based on a modified cross-validation procedure and we establish an oracle inequality on the estimation error of such estimator. The conditional densities have a wide range of applications in various fields in economics, and we add to this literature a new application of nonparametric difference-in-differences models with continuous treatments. For this application, we establish the identification, estimation, and inference results under the double/debiased machine learning framework, and we illustrate our methods by revisiting an empirical study (Duflo (2001)) of a large 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.

Service and Experience

Research Assistant

- UCLA: Winter 2019, 2020, 2021
  Project(s): cross-validation; big-data; non-separable models
  Reference(s): Denis Chetverikov, Zhipeng Liao, Rosa Matzkin
- UC Berkeley: 2016-2017
  Project(s): microfinance; government spending multiplier
  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

- 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

Teaching

Instructor

- Introduction to Econometrics, Summer 2020, 2021, 2022 (Undergraduate, UCLA)

Teaching Assistant

- Introduction to Econometrics; Intermediate Microeconomics; Pricing and Strategy (Undergraduate, UCLA)
- Econometrics: Linear Models and Nonparametric Methods (PhD Courses, UCLA)

References

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

Rosa Matzkin
Department of Economics
UCLA
Matzkin@econ.ucla.edu

Others

English; Mandarin Chinese; on F-1 Visa

Python; R; Matlab; Stata; LaTeX