

# LIANG ZHONG

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## EDUCATION

Ph.D., Economics, Boston University, Boston, MA, May 2025 (expected)  
Dissertation Title: *Essays on Causal Inference, Structural Estimation, and their Applications*  
Main advisor: Hiroaki Kaido  
Dissertation Committee: Hiroaki Kaido, Jean-Jacques Forneron, M. Daniele Paserman

M.A., Econometrics and Quantitative Economics, Boston University, Boston, MA, 2019

B.S., Mathematics and Applied Mathematics, Zhejiang University, Hang Zhou, China, 2017

## FIELDS OF INTEREST

Econometrics, Labor Economics, Digital Economics, Optimization

## WORKING PAPERS

“[Unconditional Randomization Tests for Interference](#),” September 2024. **Job Market paper.**

“[Convexity Not Required: Estimation of Smooth Moment Condition Models](#),” (with Jean-Jacques Forneron), September 2024, **Revise and Resubmit, *Review of Economic Studies*.**

“[COPPAocalypse? The Youtube Settlement's Impact on Kids Content](#),” (with Garrett Johnson, Tesary Lin, and James Cooper), April 2024, **Revise and Resubmit, *Management Science*.**

“[Racial Screening on the Big Screen? Evidence from the Motion Picture Industry](#),” (with Angela Crema, and M. Daniele Paserman), November 2023.

## WORK IN PROGRESS

“Contextual Bandit Mechanism: Optimal Delegation in the Experimentation Cycle” (with Zixian Liu)

## PRESENTATIONS (\*: CO-AUTHOR PRESENTS)

Midwest Econometrics Group Conference, Lexington, KY, 2024  
Greenline Workshop in Econometrics, Boston, MA, 2024  
19th Economics Graduate Student Conference, St. Louis, MO, 2024  
NBER SI 2024 Digital Economics and Artificial Intelligence, Cambridge, MA, 2024  
New York Camp Econometrics (Poster Session), Bolton Landing, NY, 2023  
University of Rochester Simon Business School\*, Rochester, NY, 2023  
Columbia Business School\*, New York, NY, 2023  
SOLE Annual Meeting, Minneapolis, MN, 2022  
WEAI Annual Conference\*, Portland, OR, 2022  
United States Military Academy West Point\*, West Point, NY, 2022  
EEA-ESEM Congress\*, Milano, Italy, 2022  
Boston University, Econometrics Seminar, Boston, MA, 2021-2024

## FELLOWSHIPS AND AWARDS

Doctoral Fellowship, Boston University, 2019-2024  
Optimization-Conscious Summer School Travel Grant, University of Chicago, 2023  
IED Travel Grant, Boston University, 2022-2024  
MA Prize for Best Paper, Boston University, 2019  
Distinction in the MA Comprehensive Examination, Boston University, 2018  
Excellence Award in the 7<sup>th</sup> Chinese Mathematics Competition, 2015

## WORK EXPERIENCE

### ACADEMIC

Research Assistant for Prof. Kevin Lang, Boston University, 2024  
Research Assistant for Prof. Jean-Jacques Forneron, Boston University, 2021-2023  
Research Assistant for Prof. Hiroaki Kaido, Boston University, 2020-2022  
Research Assistant for Prof. Adam Guren, Boston University, 2018  
Research Assistant for Prof. Raymond Fisman, Boston University, 2018

### NON-ACADEMIC

Summer Associate, Analysis Group, Boston, MA, 2022

## TEACHING EXPERIENCE

Teaching Fellow, Econometrics (MA-level), Department of Economics, Boston University,  
Spring 2024 (**Evaluation Score: 4.10/5**)  
Teaching Fellow, Advance Econometrics II (2<sup>nd</sup> year Ph.D), Department of Economics,  
Boston University, Fall 2023 (**Evaluation Score: 4.45/5**)  
Teaching Fellow, Econometrics (MA-level), Department of Economics, Boston University,  
Spring 2021 (**Evaluation Score: 4.73/5, with course benchmark of 4.15**)  
Teaching Fellow, Microeconomic Theory (MA-level), Department of Economics, Boston  
University, Fall 2020 (**Evaluation Score: 4.69/5, with course benchmark of 4.03**)

**LANGUAGES:** English (Fluent), Mandarin (Native)

**COMPUTER SKILLS:** C, MATLAB, R, Python, JULIA, STATA(MATA), Version Control(git)

**CITIZENSHIP/VISA STATUS:** China/F1

## REFERENCES

**Professor Hiroaki Kaido**  
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Boston University  
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**Professor Jean-Jacques  
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## **Unconditional Randomization Tests for Interference** (Job Market Paper)

When conducting causal inference or designing policy, researchers are often concerned with the existence and extent of interference between units, influenced by factors such as distance, proximity, and connection strength. However, complex correlations across units pose significant challenges for inference. This paper introduces partial null randomization tests (PNRTs), a novel framework for testing interference in experimental settings. PNRTs adopt a design-based approach, combining unconditional randomization testing with pairwise comparisons to enable straightforward implementation and ensure finite-sample validity under minimal assumptions about network structure. To illustrate the method's broad applicability, I apply it to a large-scale experiment by Blattman et al. (2021) in Bogotá, Colombia, which evaluates the impact of hotspot policing on crime using street segments as units of analysis. I find that increasing police patrolling time in hotspots has a significant displacement effect on violent crime but not on property crime. A simulation study calibrated to this dataset further demonstrates the strong power properties of PNRTs and their suitability for general interference scenarios.

## **Convexity Not Required: Estimation of Smooth Moment Condition Models**

*(with Jean-Jacques Forneron)*

Generalized and Simulated Method of Moments are often used to estimate structural Economic models. Yet, it is commonly reported that optimization is challenging because the corresponding objective function is non-convex. For smooth problems, this paper shows that convexity is not required: under a global rank condition involving the Jacobian of the sample moments, certain algorithms are globally convergent. These include a gradient-descent and a Gauss-Newton algorithm with appropriate choice of tuning parameters. The results are robust to 1) non-convexity, 2) one-to-one non-linear reparameterizations, and 3) moderate misspecification. In contrast, Newton-Raphson and quasi-Newton methods can fail to converge because of non-convexity. The condition precludes non-global optima. Numerical and empirical examples illustrate the condition, non-convexity, and convergence properties of different optimizers.

## **Racial Screening on the Big Screen? Evidence from the Motion Picture Industry**

*(with Angela Crema and M. Daniele Paserman)*

We develop a model of discrimination that allows us to interpret observed differences in outcomes across groups, conditional on passing a screening test, as taste-based (employer,) statistical, or customer discrimination. We apply this framework to investigate the nature of non-white underrepresentation in the US motion picture industry. Leveraging a novel data set with racial identifiers for the cast of 7,000 motion pictures, we show that, conditional on production, non-white movies exhibit higher average revenues and a smaller variance. Our findings can be rationalized in the context of our model if non-white movies are held to higher standards for production.