Carol Xiaomiao Gao

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Education

Smith College May 2022
A.B. Mathematics, A.B. Quantitative Economics (High Honors) GPA: 3.99/4.00

Relevant Courses

Econometrics (ECO 240)
Real Analysis (MTH 281)
Measure Theory (MTH 400)
Optimization Methods (15.093)
Applied Market Design (ECO 258)
Mathematical Economics (ECO 255)
Dynamical Systems and Chaos (MTH 364)
Robust Modeling, Optimization, and Computation (15.094)

Research Experience

MIT Blueprint Labs June 2022 - Present
Research Assistant for *Prof. Parag Pathak* and *Prof. Joshua Angrist* *Cambridge, MA*

- Leveraged randomization in the Deferred-Acceptance (DA) mechanism and used travel time to offered schools as the instrument to estimate the causal effect of student travel on academic achievement.
- Evaluated causal school value-added using school assignments as instruments for enrollment and formed empirical Bayes posteriors using obtained IV estimates to further explore the minimal effect on achievement.
- Estimated individual preference for travel using rank-ordered mixed logit model to analyze heterogeneous effect of travel across families with difference travel preferences.

Smith College, Department of Economics August 2021 - May 2022
Research Assistant for *Prof. Lucie Schmidt* *Northampton, MA*

- Selected and created variables from the Survey of Low-Income Aged & Disabled (SLIAD), then employed difference-in-differences design to examine the effect of food stamp eligibility on family security of SSI recipients.
- Explored the newly released Children Development Supplement (CDS) data and extracted information on family structure to perform analyses on the effect of Social Security income on children's academic performance.

Smith College, Department of Economics February 2021 - August 2021
Research Assistant for *Prof. Mariyana Zapryanova* *Northampton, MA*

- Cleaned and merged policing and crime data in Chicago, then selected and created variables that proxy for parameters in the theoretical model.
- Used spatial polygon data to identify adjacent police districts in Chicago and created visualizations of spatial distributions of policing and crime rates in R.
- Employed spatial Durbin model to examine the spillover effect of policing and vigilance.
- Utilized difference-in-differences and event study designs to analyze the changes in police arrest behavior following a BLM protest by comparing between crime incidents closer and farther from a protest.
- Honors thesis:*"The Effect of Black Lives Matter Protests on Crime and Arrest Rates: Evidence from Chicago"*.

Smith College, Department of Economics December 2019 - February 2021
Research Assistant for *Prof. Jorge Vásquez* *Northampton, MA*

- Created a model of optimal criminal search and solved for the optimal allocations of policing that minimize total crime rates in the cases of observed and unobserved policing.
- Theoretically examined the effect of increasing policing and penalty on crime reduction, accounting for search behavior, and provided policy implications.

- Simulated and visualized the model in MATLAB and Mathematica to analyze the model numerically.
- Working paper: *"Optimal Policing with (and without) Criminal Search"* 2023 (with Jorge Vásquez), *Revise and Resubmit,* ***Review of Economic Design***.

Smith College, Department of Mathematics February 2020 - May 2020
Research Assistant for *Prof. Tian An Wong* *Northampton, MA*

- Developed discrete definition of compactness scores in the context of dual graphs of district maps.
- Compared and tested different scores and evaluated how they mitigate the four main issues associated with gerrymandering.

Conferences

"The Effect of Black Lives Matter Protests on Crime and Arrest Rates: Evidence from Chicago"
Issues in Political Economy 28th Annual Conference, New York February 2022
Promoting Inclusion in Economic Research (PIER) Conference, Williams College May 2022

"Criminal Displacement and Optimal Policing"
PIER Conference, Williams College May 2021

"Discrete Compactness Scores and Political Gerrymandering"
Hudson River Undergraduate Mathematics Conference April 2020
(Cancelled due to COVID-19)

Honors and Awards

Ann Kirsten Pokora Prize May 2022
To a senior with a distinguished academic record in mathematics
Samuel Bowles Prize May 2022
For the best thesis on an economics subject
Sidney S. Cohen Prize May 2022
For outstanding work in the field of economics
Suzan Rose Benedict Prize May 2020
To a sophomore for excellence in mathematics
Dean's list 2019-2022

Teaching Experience

Smith College, Department of Economics September 2020 - December 2020
Teaching Assistant for *Intro and Intermediate Macroeconomics* *Northampton, MA*

- Held weekly tutoring hours for assignments and review sessions before exams.
- Prepared and typesetted solutions to problem sets and graded problem sets.

Workshops and Pipelines

Harvard/MIT Economics Application Assistance and Mentorship Program (AAMP)
UC Berkeley Pipeline to Grad School Bootcamp, Office for Graduate Diversity
Economics Pre-Doc Workshop for Underrepresented Minorities, Texas A&M University

Skills and Languages

Programming	Stata, R, Python, Julia, MATLAB, HTML, CSS
Software	LaTeX, Mathematica, Gurobi, JuMP, TensorFlow
Languages	Native proficiency in English and Chinese, working proficiency in Japanese