

# CAROL XIAOMIAO GAO

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## EDUCATION

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**Smith College**

B.A. Quantitative Economics and Mathematics

*Expected May 2022*

Overall GPA: 3.99/4.00

## TECHNICAL STRENGTHS

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**Statistical programming**

Stata (Advanced), R (Advanced), Python, MATLAB

**Other programming/software**

LaTeX, Mathematica, ArcGIS, Microsoft Office

## RELEVANT COURSES

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Intermediate Econometrics (ECO 240)

Applied Market Design (ECO 258)

Real Analysis (MTH 281)

Measure Theory (MTH 400 - Graduate level)

Mathematical Economics (ECO 255)

Game Theory (ECO 420)

Probability (MTH 246)

Dynamical Systems and Chaos (MTH 364)

## RESEARCH EXPERIENCE

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**Smith College, Department of Economics**

December 2019 - Present

*Research Assistant for Prof. Jorge Vásquez (Wesleyan University)*

- Create a model of optimal criminal search and solve for the optimal allocations of policing that minimize total crime rates in the cases of observed and unobserved policing
- Theoretically examine the effect of increasing policing and penalty on crime reduction, accounting for search behavior, and provide policy implications
- Simulate and visualize the model in MATLAB and Mathematica to analyze the model numerically
- Read relevant literature on displacement effect of crime and optimal sequential search and perform literature review

**Smith College, Department of Economics**

February 2021 - Present

*Research Assistant for Prof. Mariyana Zapryanova*

- Clean and merge datasets of over 1 million observations on policing and crime in Chicago, then select and create variables that proxy for parameters in the theoretical model
- Use spatial polygon data to identify adjacent police districts in Chicago and create visualizations of spatial distributions of policing and crime rates in R
- Perform fixed-effect OLS estimates in Stata to examine the spillover effect of policing and vigilance
- Clean and merge datasets of over 1 million observations on Indian courts and judges and perform fixed effect analyses to examine the effect of diversity among judges on sentencing outcomes in India

**Smith College, Department of Economics**

August 2021 - Present

*Research Assistant for Prof. Lucie Schmidt*

- Select and create variables from the Survey of Low-Income Aged & Disabled (SLIAD) to examine the effect of food stamp eligibility on family security of SSI recipients
- Explore the newly released Children Development Supplement (CDS) data and extract information on family structure to perform analyses on the effect of Social Security income on children's academic performance

**Smith College, Department of Mathematics**

February 2020 - May 2020

*Research Assistant for Prof. Tian An Wong*

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

**WORK IN PROGRESS**

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“Criminal Displacement and Policing: A Search-theoretic Approach,” with Prof. Jorge Vásquez.

*Honors thesis:* “The Effect of Black Lives Matter Protests on Crime and Arrest Rates: Evidence from Chicago” (Advisor: Prof. Mariyana Zapryanova).

**CONFERENCE PRESENTATIONS**

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2021: “Criminal Displacement and Policing: A Search-theoretic Approach,” Promoting Inclusion in Economic Research (PIER) Conference, Williams College, May 1st 2021

**AWARDS**

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2020: Suzan Rose Benedict Prize awarded to a sophomore for excellence in Mathematics

2018, 2019, 2020: Dean’s list

**OTHER EXPERIENCE**

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**Smith College, Department of Economics**

September 2020 - December 2020

*Teaching Assistant, ECO 253 Intermediate Macroeconomics*

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

**Smith College, Department of Economics**

September 2020 - December 2020

*Teaching Assistant, ECO 153 Introduction to Macroeconomics*

- Held weekly tutoring hours for assignments and review sessions before exams, and graded problem sets

**Women in Mathematics in New England (WIMIN) Conference**

October 2020

*Chair of Student Talk*

- Announced the speakers, monitored chat for questions, and set up the presentations

## REFERENCES

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### **Lucie Schmidt**

Professor of Economics  
Smith College  
lschmidt@smith.edu

*Relationship:* I have been working as a research assistant for Professor Schmidt since August 2021 and am currently taking Labor Economics with her.

### **Jorge Vásquez**

Assistant Professor of Economics  
Wesleyan University  
jvasquez@wesleyan.edu

*Relationship:* I have been working as a research assistant to Professor Vásquez since December 2019 on a project and have a co-authored paper on criminal displacement and optimal policing with him. I took Applied Market Design and Mathematical Economics with him. I was also his teaching assistant for Intermediate Macroeconomics in Fall 2020.

### **Mariyana Zapryanova**

Assistant Professor of Economics  
Smith College  
mzapryanova@smith.edu

*Relationship:* Professor Zapryanova is my thesis advisor. I took Intermediate Econometrics with her and have been working as her research assistant since February 2021. She also supervised me on a special study project on crime displacement.