# Jessica Shi

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Research interests Data-driven decision-making, algorithms, transportation, healthcare, game theory, optimization

## Education

**Columbia University** (*GPA: 3.98, Fall 2020-Spring 2023*)      New York, NY

Bachelor of Science, Fu Foundation School of Engineering      *Sept 2020 – Expected May 2024*

**Major:** Operations Research, Analytics track, **Minors:** Economics, Computer Science

**Selected coursework**

- Mathematics: Linear Algebra, Multivariable Calculus, Differential Equations, Probability for Engineers, Discrete Mathematics, Foundations of Optimization, Stochastic Systems & Applications, Statistics & Data Analysis, Advanced Optimization, Introduction to Modern Analysis, Optimization I (PhD core class)
- Economics: Principles of Economics, Int. Microeconomics, Int. Macroeconomics, Intro to Econometrics, AI, Games, and Markets (Game theory)
- Computer Science: Computational Problem Solving (Python), Data Structures (Java), Advanced Programming (C/Unix), Computer Science Theory, Analysis of Algorithms, Introduction to Databases, Foundations of Data Science, Data Analytics and Machine Learning for Operations Research

**Jamestown High School** (*GPA: 4.54.* Valedictorian)      Williamsburg, VA

High School      *Sept 2016-June 2020*

## Research experience

**Proactive Patient Treatment in Sepsis**

Mentors: Carri Chan (Columbia Business School), Vineet Goyal (Columbia IEOR)      *February 2023-current*

- Machine learning for early detection of sepsis applied to resource allocation for sepsis treatment.
- Program, run, and interpret simulations for a complex hospital operations Markovian process in Python.
- Train and validate a deep learning model (multi-output Gaussian process and recurrent neural network).

**Urban Design and Children's Mobility and Crash Risks in US Cities**

Mentors: Christopher Morrison (Columbia Mailman School of Public Health)      *Mar 2022 – Aug 2022*

- Utilize Python, R, and ArcGIS to extract features and compute network-level measures from OpenStreetMap vector data as input to regression models. Paper in progress.

**Statistical Teleodynamics of Emergent Equilibria in the Schelling Game**

Mentors: Venkat Venkatasubramanian (Columbia University, Chemical Engineering)      *Jan 2021 – Sept 2021*

- Construct mathematical models, program agent-based simulations in NetLogo, and perform data analysis on the Schelling game.
- [Publication with mention](#). Publication as co-author in progress.

**Modeling the Maximum Potential of Rotational Grazing**

Mentors: Junping Shi (College of William & Mary)      *Jan 2019-Jan 2020*

- Agent-based modeling and simulation in NetLogo was used in a computer simulation to show the dynamical change and interaction of the cows and the grass in different paddock situations and rotation periods over time.

[Online Article.](#)

## Teaching experience

**Teaching assistant, Department of Economics (Columbia University)**

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|---|---:|
| ECON1105: Principles of Economics | *Fall 2022* |
| ECON3211: Intermediate Microeconomics | *Spring 2023* |
| ECON3142: Introduction to Econometrics | *Fall 2023* |

• Hold a weekly recitation session and office hours, and grade problem sets.

## Industry experience

**Asana,** Product Engineering                                                                San Francisco, CA

*Software Engineer Intern*                                                                        *Summer 2023*

• Develop new features to educate customers and drive conversion from free to paid plans.

• Engineered an onboarding feature for new users with React, Typescript, and LunaDb (in-house query system).

**Microsoft,** WebXT Maps & Geospatial                                                            Seattle, WA

*Software Engineer Intern*                                                                        *Summer 2022*

• Implemented new features for a portal for visualizing and analyzing geospatial data to meet Microsoft-internal customer needs.

• Contributed an user interface component library to an open-source package react-awesome-query-builder.

• Frontend development with Typescript, React, and Redux; backend development in C# and .NET core.

**US Census Bureau and Coding it Forward,**                                                          Remote

*Software Engineer Intern and Civic Digital Fellow*                                                *Summer 2021*

• Developed an automated production system for statistical products for criminal justice agencies that provide data to the Criminal Justice Administrative Records System (CJARS) with an emphasis on privacy and disclosure considerations.

• Full-stack web development in Python, Django, HTML, SQL, Markdown and work with a complex relational database.

## Presentations

**Statistical Teleodynamics of Emergent Equilibria in the Schelling Game**

• 2023 INFORMS Annual Meeting, poster

• Joint Mathematics Meeting 2022, poster and talk

• Columbia Undergraduate Data Science Fair 2022, poster

**Modeling the Maximum Potential of Rotational Grazing**

• Joint Mathematics Meeting 2020, poster

• Shenandoah Undergraduate Math Conference 2020, talk

**Modeling and Predicting the Dispersal of Lycorma delicatula in North America**

• Joint Mathematics Meeting 2019, poster

## Skills

**Programming**: *Proficient in*: R, Stata, Python (pandas, numpy, arcpy, scikit-learn), Wolfram Language, NetLogo, Django, Java, C, Git, HTML/CSS, SQL, Node.js, ArcGIS, Javascript/Typescript, React, Redux, *Familiar with*: C++, C#, Flask, Matlab

**Languages**: English (fluent), Mandarin (advanced)

## Leadership

**Columbia Data Science Society, Co-President** *Oct 2020 – present*

- Organize and promote events at Columbia, including workshops, networking, and panel discussions.
- Ran the largest hackathon on campus with 150+ participants.

**Columbia INFORMS, Co-President** *Oct 2021 – present*

- Worked to reestablish the INFORMS student chapter's official standing nationally.
- Plan and execute social and academic events for operations research and management sciences on campus.
- Founded the first campus-wide poker tournament with 200+ students.

**Columbia Kappa Phi Lambda, President** *April 2020 – present*

- Lead Columbia's only Asian-interest sorority in pursuing sisterhood, service, and cultural diversity.
- Achieved the promotion from associate chapter to chapter status.

## Honors and scholarships

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|---|---|
| Amazon SCOT INFORMS Scholarship | 2023 |
| Tau Beta Pi Junior Initiate | 2022 |
| Goldersleeve Scholarship (Columbia Unversity) | 2022 |
| Generation Google Scholarship for Supply Chain & Fulfillment | 2022 |
| James & Elizabeth Li Scholarship (Columbia University) | 2021 |
| National Lockheed Martin STEM Scholar | 2020-2024 |
| Peninsula Community Foundation Scholar | 2020-2024 |
| National Honor Society Scholarship Semifinalist | 2020 |
| National Elks Most Valuable Student | 2020 |

## Other interests

Tennis, hiking, biking, climbing, painting, and photography.