

Thomas H. Li

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EDUCATION

University of Pennsylvania | Philadelphia, PA *Expected May 2025*
Candidate for Master of Science in Engineering, Data Science
Candidate for Bachelor of Arts, Mathematical Economics

- *Cumulative GPA*: 3.99/4.00 (Undergrad); 4.00/4.00 (Masters)
- *Coursework*: Statistics & Modeling [Econometrics, Machine Learning, Stochastic Processes, Time Series, Probabilistic Choice Models, Observational Studies]; Economic Theory [Micro, Macro, Labor, Contract]; Computer Science [Data Structures & Algorithms, Big Data]; Mathematics [Real Analysis, Probability, Linear Algebra]
- *Honors & Appointments*: Simon Kuznets Fellowship Award; Economics Department Undergraduate Advisory Board; Penn Federal Reserve Challenge (Captain, Semi-finalist); Marks Family Writing Center Fellow

RESEARCH EXPERIENCE

Senior Thesis in Economics | Philadelphia, PA *August 2024 – Present*
Lead researcher, advised by Dr. Jere Behrman & Dr. Z. John Zhang

- Lead study quantifying consumer preferences for various attributes of digital strategies employed by luxury brands and exploring demographic heterogeneity in preferences. Secure grant funding, develop and administer a survey of 400 consumers, and perform conjoint analysis using multinomial logit and hierarchical Bayesian methods.

Econometrics Reading Group | Philadelphia, PA *August 2024 – Present*
Member, lead by Dr. Francis X. Diebold

- Read and discuss papers on predictive modeling in time-series environments. Current focus is on financial markets, business cycles, dynamic factor models, regime switching models, and tree-based ML methods. One of three undergraduates invited for the group.

Computational Social Science Lab at Penn | Philadelphia, PA *October 2023 – Present*
Research Assistant for Dr. Francisco Barreras & Dr. Duncan Watts

- Simulate human trajectory datasets with heterogeneous agents and stochastic movement. Develop nonhomogeneous Poisson process sampler to model data sparsity. Code PySpark and Python implementations of spatial data processing, trajectory clustering algorithms (e.g., DBSCAN and Project Lachesis), and mobility metrics.
- Co-author on two working papers to (1) propose a framework for evaluating the robustness of processing pipelines on sparse GPS trajectory data and (2) detail findings and recommendations. Presented paper in an oral talk at the 2024 IC2S2 Conference.

Federal Reserve Board of Governors | Washington, D.C. *May 2023 – August 2023*
Economic Research Intern for Dr. Juan Londono & Dr. Sai Ma *May 2024 – August 2024*

- Developed a production-grade script pipeline using R, Stata, MATLAB, and Bash to scrape over 1 GB of economic data and generate a monthly indicator for macroeconomic uncertainty utilizing dynamic factor and stochastic volatility models. Automated a 3-day manual process, reducing it to under 5 minutes of work.
- Programmed panel regressions and VARs, created publication-quality charts, and compiled data, analyses, and literature reviews for presentations to central bank governors. Co-authored FEDS Note on global transmission channels of inflation uncertainty.

Behavior Change for Good Initiative & Wharton OID Department | Philadelphia, PA *June 2022 – May 2023*
Research Assistant for Dr. Katy Milkman & Dr. Angela Duckworth

- Supported research on vaccination and student retention projects, optimizing intervention design and data analysis pipelines in R and Excel. Presented posters at two Penn undergraduate research events. Acknowledged in *Nature* vaccination study.
- Assisted Ph.D. students with API data scraping, survey design, visualizations, and literature reviews for behavioral research.

TEACHING EXPERIENCE

University of Pennsylvania School of Engineering and Applied Science | Philadelphia, PA *January 2023 – December 2023*
Teaching Assistant, CIS 1600: Discrete Mathematics for Computer Science

- Taught weekly recitations of 15+ undergraduates in a class of 280 students, held office hours (helped around 20 students/week), wrote homework rubrics, and graded homework and exams. TA staff consistently rated by students as “very good.”
- Content covered proof techniques, set theory, combinatorics, probability, and graph theory (introductory CS course at Penn).

University of Pennsylvania Marks Family Writing Center | Philadelphia, PA *January 2023 – May 2023*
Writing Fellow

- Nominated and selected by writing faculty (among 12 out of 1250 first-year students) for superb writing and interpersonal skills. Worked with students one-on-one to develop academic writing abilities and understanding of logic, genre, and rhetoric.

WORKING PAPERS

- [1] **Thomas H. Li**, Juan M. Londono, & Sai Ma. “The Global Transmission of Inflation Uncertainty,” *FEDS Notes*. (Forthcoming)
- [2] Francisco Barreras, **Thomas H. Li**, & Duncan J. Watts. “Technical Note: Simulating Human Mobility with Sparsity.” (In Progress)
- [3] Francisco Barreras, **Thomas H. Li**, & Duncan J. Watts. “Trajectory Mining in the Face of High Sparsity.” (In Progress)
- [4] **Thomas H. Li**. “Luxury Exclusivity in the Digital Age: A Conjoint Approach.” (Senior Thesis, In Progress)

CONFERENCE PRESENTATIONS

- [1] **Thomas H. Li**, Francisco Barreras, & Duncan J. Watts (2024). “Trajectory Data Mining in Highly Sparse Location Datasets.” *10th International Conference on Computational Social Science*. (Oral Presentation)

SKILLS & INTERESTS

Coding Languages: Python; MATLAB; R; Java; Stata; SQL; OCaml; Bash

Technical Software: Git; AWS EC2; Spark; LaTeX; Excel; Tableau; Qualtrics

Languages: English (fluent), Mandarin Chinese (near-native proficiency)

Interests: Drums; Guitar; Running; Podcasts