

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 (Master's)
- *Coursework:* Statistics & Modeling [Econometrics, Machine Learning, Stochastic Processes, Time Series, Probabilistic Choice Models, Observational Studies]; Economic Theory [Micro, Macro, Labor, Contract]; Mathematics [Real Analysis, Linear Algebra, Probability]; Computer Science [Data Structures & Algorithms, Big Data]
- *Appointments:* Penn Federal Reserve Challenge Team Captain; Economics Department Undergraduate Advisory Board; Marks Family Writing Center Fellow

HONORS

Simon Kuznets Fellowship Award in Economics

2024

- Awarded to 3 (out of approx. 200) juniors deemed by Penn economics faculty to have outstanding potential in economics.

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, Led 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 machine learning 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

- Lead development of an agent-based model simulating human trajectories with heterogeneous agents and stochastic movement. Formalized a self-exciting point process sampler using hierarchical Poisson processes to replicate realistic data sparsity. Code PySpark and Python implementations of spatial data processing, trajectory clustering algorithms (e.g., DBSCAN), and mobility metrics.
- Contribute significantly to two working papers: (1) proposing a model for simulating human trajectories with realistic sparsity patterns, and (2) evaluating robustness of processing pipelines to sparse data. Presented findings in a parallel 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 (OECD, IMF, World Bank) 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.
- Designed and programmed a series of panel regression and VAR specifications to explore the economic effects and cross-country transmission channels of inflation uncertainty. First author on forthcoming *FEDS Notes* article detailing findings.

Behavior Change for Good Initiative | Philadelphia, PA

June 2022 – May 2023

Research Assistant for Dr. Katy Milkman & Dr. Angela Duckworth

- Supported implementation of large-scale field experiments on vaccination and student retention. Prepared treatment materials, streamlined data analysis pipelines in R, and suggested improvements to intervention design. 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.

PUBLISHED & FORTHCOMING PAPERS

- [1] **Thomas H. Li**, Juan M. Londono, & Sai Ma (2024). “The Global Transmission of Inflation Uncertainty.” *Forthcoming at FEDS Notes*.

WORKING PAPERS

- [1] **Thomas H. Li** & Francisco Barreras. “A Synthetic Dataset and Sandbox Environment for Analysis of Pre-processing Algorithms for GPS Human Mobility Data.” [arXiv preprint](#).
- [2] Francisco Barreras, **Thomas H. Li**, & Duncan J. Watts. “Trajectory Mining in the Face of High Sparsity.”
- [3] **Thomas H. Li**. “Luxury Exclusivity in the Digital Age: A Conjoint Approach.” (Senior Thesis)

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*. (Parallel Talk)

SKILLS

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

Technical Software: Git; AWS Cloud Computing (EC2); Spark; L^AT_EX; Excel; Tableau; Qualtrics

PERSONAL

Citizenship: United States of America

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

Interests: Drums; Guitar; Running; Podcasts