Maximillian Guo
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Education

Stanford Graduate School of Business — Stanford, CA
Non-degree seeking Research Fellow. — *June 2024*

Harvard University (GPA: 3.987/4.0). — Cambridge, MA
S.M. in Applied Mathematics (Concurrent Master's). — *May 2023*
A.B. Joint in Computer Science and Statistics, *magna cum laude*. — *May 2023*
Awards: *Phi Beta Kappa, John Harvard Scholar (x3), Detur Prize, Distinction in Teaching (x4).*

Research Experience

Stanford Graduate School of Business — Stanford, CA
Pre-doctoral Research Fellow in Global Capital Allocation Project Group — *July 2023 - Present*

- Research assistantship in international finance for Professors Matteo Maggiori, Antonio Coppola, and Jesse Schreger
- Analyzing terabytes worth of global ownership data with parallel cluster computing using Stanford's Sherlock cluster.
- Developing aggregation algorithm to link downstream subsidiaries with upstream shareholders.
- Reviewing literature on geoeconomics and data sources for financial news outlets.
- Improving lab efficiency by developing several assistive programs for managing multiple large-scale data projects.

Harvard School of Engineering and Applied Sciences — Cambridge, MA
Student Researcher · Summer Program for Undergraduates in Data Science Research Fellow — *May 2022 - March 2023*

- Invented a new deep Bayesian neural network-based model to interpolate and improve upon the performances of maximum a-posteriori based Neural Linear Models and fixed-kernel Gaussian Processes.
- Empirically evaluated different parametrizations and architectures of the model with regularization interpretations.
- Benchmarked the model against other state-of-the-art deep Bayesian models with different nonstationary datasets.
- Presented weekly updates and relevant papers at the Data to Actionable Knowledge Lab; advised by Dr. Beau Coker.
- Organized results and literature review into senior thesis. Link to Senior Thesis.

Harvard University — Cambridge, MA
Student Researcher for AI for Social Good (Extension of CS288 Course) — *August 2022 - December 2022*

- Curated dataset of publicly available satellite image mosaics using Sentinel-2 for each of the 37 regions of Nigeria.
- Adapted convolutional-neural network as computer vision model for prediction of multi-dimensional poverty in Nigeria.
- Submitted with coauthor and accepted as short paper at AAAI Workshop on AI for Social Good. Link to Short Paper.

Harvard Graduate School of Education — Cambridge, MA
Research Assistant at Learning in Technology Lab — *August 2021 - December 2021*

- Performed transfer learning with Facebook's computer vision model detectron2 to identify and classify scientific lab equipment usage in high-school chemistry lab settings.

Harvard School of Engineering and Applied Sciences — Remote
Research Assistant in Harvard Signal Processing (CRISP) Group — *February 2020 - September 2020*

- Implemented new iterative machine learning model for compressed convolutional sparse dictionary learning in PyTorch.
- Trained and evaluated model using mean-squared error and PSNR metrics against benchmark models, including denoising approximate message passing and wavelet compression methods; advised by Dr. Bahareh Tolooshams.

Massachusetts Institute of Technology — Remote
Student Researcher with MIT PRIMES-USA Program (20 students selected nationwide) — *January 2018 - January 2019*

- Proved an invariance in Bar Natans perturbation of Khovanovs cohomology as a bigraded vector space under isomorphism in the Conway mutation of a knot; advised by Dr. Jianfeng Lin. Link to Final Report.

Teaching Experience

Harvard University Cambridge, MA
(Head) Teaching Fellow (TF) for Harvard's Introduction to Artificial Intelligence Course *Fall 2022, Fall 2021*

- Expanded course from an enrollment of 65 in 2021 (as a regular TF) to an enrollment of 115 in 2022 (as the head TF).
- Created 5 problem sets with a combined total of 5 in-depth programming problems and over 20 theoretical problems.
- Supervising the creation of over 15 new handouts (new section notes, and lecture notes). Link to Course Materials.
- Directing weekly meetings to coordinate responsibilities of course material creation, grading, and responding to students.

Harvard University Cambridge, MA/Remote
Teaching Fellow/Course Assistant for Multiple Courses *August 2020 - December 2022*

- On course staff for 9 courses in math, statistics, computer science (One or more iterations of: Theoretical computer science, Machine Learning, Artificial Intelligence, Group Theory, Probability, Statistical Inference).
- Taught over 50 sections, ranging from large reviews with over 100 students to 1-1 tutoring, both virtually and in person.

Professional Activities

Quarterly Journal of Economics Referee Cambridge, MA
Referee *May 2023*

- Critically analyzed paper submission on role of AI in economic growth for the QJE for Professor Robert Barro.

Five Rings Capital New York, New York
Quantitative Trader Intern *May 2021 - August 2021*

- Conducted quantitative data analysis research and mock trading (intentionally vague in compliance with the company).

Leadership and Volunteering

Harvard Association for U.S. China Relations Cambridge, MA
Executive Board, Finance Director (2021-2022), Conference Director (2020-2021) *August 2020 - August 2022*

- Directed budget of $200,000 for international conference, community, and organizational expenses.
- Partnered with nonprofit to host a 5 week long hybrid conference for Chinese students.
- Recruited over two dozen professors, student organizations, and student mentors for conference programming involving seminars, panels, masterclasses, and mentorship pairings.
- As seminar leader, taught a week-long rigorous course on algorithms to fifty students, complete with self-made lecture slides, notes, and Jupyter Notebook demos. Course Materials GitHub Repository.

Harvard Square Homeless Shelter Cambridge, MA
Supervisor (2022-2023), Resource Advocate (2021-2022) *November 2021 - December 2022*

- Connected several guests to local resources for shelter, food, and administrative needs on a weekly basis.
- Instituted a new centralized activities tracker to document dozens of client cases and coordinate across resource advocates.

Winthrop House Community Cambridge, MA
Hutchinson Prize Senior Award Winner *May 2023*

- Actively hosted Chinese-language learning tables and themed study breaks to foster the Winthrop House Community.

Skills and Interests

Programming Languages: Python , R , C++ , Stata , Bash
Python Packages: Numpy , Pandas , Scipy , Seaborn , Sklearn , PyTorch
Interests: International Development , Juggling , Calisthenics , Piano
Languages: Mandarin (Fluent)