

Brandon Kaplowitz

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Education

New York University, Stern School of Business

FIFTH YEAR, PH.D. IN ECONOMICS

Expected Completion, June 2025

New York, NY

Fall 2019 – Present

University of Chicago

B.A. IN ECONOMICS (HONORS) & B.A. IN MATHEMATICS

Combined GPA: 3.77/4.0, General Honors, Completed Requirements for B.S. in Mathematics: Specialization in Economics

Chicago, IL

2014 – 2017

University of Michigan, Honors Program

ECONOMICS CONCENTRATION, LSA MATHEMATICAL SCIENCES MAJOR

Ann Arbor, MI

2013 – 2014

Phillips Exeter Academy

HIGH SCHOOL DIPLOMA, HIGH HONORS

Exeter, NH

2009–2013

Ph.D Level Courses

Economics

- Macroeconomics I & II (Sargent, Ljungqvist, Gertler, Boar)
- Microeconomics I & II (Rubinstein, Bisin, Pearce, Lizzeri)
- Econometrics I & II (Vuong, Menzel, Cogley, Christensen)
- Topics in Macroeconomics: Public Finance (Ndiaye)
- Topics in Macroeconomics: Macroeconomic Perspectives on Labor Markets (Menzio)
- Macroeconomic Perspectives on Inequality (Princeton, Violante)
- Advanced Macroeconomics II (Growth & Distribution) (Benhabib)
- Risk, Uncertainty and Value: Prices, Quantities and Policies (U.Chicago, L.P. Hansen, Sargent)
- Political Economy (MIT, Acemoglu)
- Financial Economics I (P. Hansen)
- Empirical Methods in Monetary and Macroeconomics (Gilchrist, audit)
- Advanced Macroeconomics I (Midrigan, audit)
- Advanced Econometrics II: Panel Data Methods (Manresa, audit)
- Summer Course on Experimental Economics/Decision Theory (Ok)
- Summer Course on Econometrics/Methodology (Christensen, Manresa)
- Math+Econ+Code: Masterclass on Optimal Transport and Economic Applications (Galichon)
- Math+Econ+Code: Masterclass on Equilibrium Transport and Matching Models in Economics (Galichon)

Mathematics

- Math for Economists I: Real and Functional Analysis (Ok)
- Math for Economists II: Probability and Ergodic Theory (Ok)
- PDE I: Introduction to PDEs (First Year Math, audit, Tabak)
- Methods of Applied Mathematics (First-year Math, Asymptotic Analysis, Variational Calculus, Greengard)
- Methods of Applied Mathematics, Second Half (Perturbation Theory, Boundary Layers, audit, Greengard)
- Stochastic Calculus (audit, Goodman)
- Statistical and Probabilistic Inference (Graphical Probability Networks, Generative Models, VAEs, Bruna)
- PDEs II (First Year Second Semester Math Ph.D., audit, Armstrong)
- Advanced PDEs: Mean Field Limits (Math Ph.D. Topics Class, Audit, Serfaty)

Computer Science

- Foundations of Machine Learning (audit, Mohri)
- Advanced Machine Learning (Learning Theory and Online Learning)(audit, Mohri)
- Deep Reinforcement Learning (online audit, Berkeley, Levine)

Experience

Research Assistant for Professor Thomas Philippon

Fall, 2022-Spring 2023

NEW YORK UNIVERSITY, STERN SCHOOL OF BUSINESS

New York, NY

- Examining Ramsey-Cass-Koopman model under empirically-consistent long-run additive growth, checking numerical simulations via semi-analytic method of matched asymptotic expansion
- Thinking through asset pricing implications, effect on yield curve.

Research Assistant for Professor Thomas Sargent

2018-2021

NEW YORK UNIVERSITY/PEKING UNIVERSITY PHBS

New York, NY

- Used Hamiltonian Monte Carlo to explore behavior of historical yield curve changes and to formulate new methods to solve VAR models with drift and stochastic volatility.
- Assisted in editing two upcoming books on Robustness and Risk and Uncertainty, as well as a new version of Recursive Macroeconomic Theory.
- TA'd an undergraduate class in Macroeconomic methods at NYUAD, and two classes at Peking University: a graduate macroeconomic class, and a programming for macroeconomics short class on Bayesian methods. Included giving lectures and coding exercises on solving dynamic programming problems and shooting methods
- Python notebook used to teach the class was later published as a core lecture of Numfocus's QuantEcon
- Used CUDA and INTEL MKL and NUMBA to speed up machine learning methods such as approximate dynamic programming and Bayesian neural networks and to explore otherwise intractable models.
- Explored 20th century historical data on yield curves and currency and making available in an easy to use format via Python Pandas package and visualizations via D3.js
- Early work reexamining Marimon, McGratten, Sargent with new computational tools.

Research Professional for Professor Greg Kaplan

2017-2018

UNIVERSITY OF CHICAGO, BECKER FRIEDMAN INSTITUTE

Chicago, IL

- Solved for viscosity solutions of heterogeneous agent macroeconomic models consisting of Hamilton-Jacobi Bellmans in Python/Matlab using finite difference with unwinding
- Assisted in writing upcoming papers on Gender Wage Gap among Top 1%
- Developed fast algorithms using CUDA and INTEL MKL with sparse matrices and automatic differentiation to solve heterogeneous agent models efficiently
- Performed data analysis on job polarization measuring interpersonal skills for jobs to explore if differences among interpersonal skills led to growing US wage inequality
- Determined preferences for labor hours with heterogeneous income by looking at Gallup data to see if top 1% has preference for working above and beyond substitution effect
- Wrote lectures for fourth year undergraduate class and week-long graduate seminar hosted by Bank of Spain on how to model economic inequality using heterogeneous agent models
- Attended third year graduate reading group where I presented on analyzing inefficiency by examining capital allocations.

Research Assistant for Professor Martin Feldstein

2016

NATIONAL BUREAU OF ECONOMIC RESEARCH

Cambridge, MA

- Improved Taxsim v9 model with R module and performed calculations using newest tax information to simulate tax burden. On website.
- Researched and curated novel datasets and papers for new centralized Economics of National Security Dataset that was sent to several NBER working groups and is used in Harvard graduate seminar.

Research Assistant for Walgreen Professor Robert Axelrod

2015

G. FORD SCHOOL OF PUBLIC POLICY, U. OF MICHIGAN

Ann Arbor, MI

- Responsible for conducting research on a wide variety of topics related to deterrence, legitimacy, compellence, and norms setting
- Designed cyberspace games for DARPA and DNI hosted conferences
- Helped write game theory model that led to second acknowledgement in PNAS paper
- Studied cyberwarfare weapon valuation by solving differential equations and gathering current data on cyber incidents for paper published in PNAS that was covered by BBC
- Developed new theories on sense-making with Dr. Axelrod using concepts from information theory, enabling new research into how people make decisions

Intern for Cyber Policy Office

2014

OFFICE OF THE SECRETARY OF DEFENSE, PENTAGON

Arlington, VA

- Drafted proposed language for a strategy on cyber deterrence for National Security Council that is to be signed and presented by the President to Congress as U.S. policy
- Participated in Wassenaar trade agreement implementation discussions between State, DoD, and NSA and analyzed its effects for an Acting Assistant Secretary of Defense
- Developed economic analyses and strategy to better understand and mitigate potential harm from the zero-day market and enable better support for defense industrial base
- Wrote paper on strategies for deterrence in cyberspace picked up by Joint Chiefs of Staff

Teaching

TA for Financial Economics (M.S. Quantitative Economics)

ECON-GA 4443, PROFESSOR STANLEY ZIN

NYU & NYU Stern
Spring 2023, Spring 2024

TA for Computational Dynamics (M.S. Quantitative Economics)

ECON-GA 4091, PROFESSOR JARDA BOROVICKA

NYU & NYU Stern
Spring 2023, Spring 2024

Co-Instructor for Data and Computation I (M.S. Quantitative Economics)

ECON-GA 4021, PROFESSOR THOMAS SARGENT

NYU & NYU Stern
Summer 2022

TA for Ph.D. Macroeconomics I (Ph.D. Economics)

ECON-GA 1025, PROFESSORS JARDA BOROVICKA, LARS LJUNGQVIST

NYU
Fall 2021

TA for Macroeconomic Foundations for Asset Pricing (Undergrad Stern Econ. Adv. Topics Class)

ECON-UB.0233, PROFESSOR STANLEY ZIN

NYU Stern
Fall 2020, 2021; Spring 2023,
Spring 2024

Early Drafts and In Progress Papers

Learning

- Value-Based Reinforcement Learning Matches Otherwise Challenging-to-Explain Consumption Patterns Out of Covid Stimulus Payments (JMP)

Inequality & Heterogeneity

- (Early Work) The Effect of Local Economic Shocks in a Geospatial Model with Moving (w/ Man Chon Iao, Doruk Gokalp)
- The AI Macroeconomy: A New Set of Benchmarks for Multiagent RL Models (Workshop Presentation 2022 ICML)
- “Bayesian Exploration Networks” (Mattie Fellows*, **Brandon Kaplowitz***, Christian Schroeder De Witt, Shimon Whiteson), Under Review, ICML 2024: <https://arxiv.org/abs/2308.13049> (* Equal Contribution)
- Early Work (planned for Neurips 2024): “Provable Convergence to Nash Equilibria with Public Beliefs in Large Imperfect Information Extensive-Form Games” (Coauthors: Gabriele Farina, Sobhan Mohammadpour, Sam Sokota).

Statistics/ML

- A Followup to Both ReBeL (Brown et al. 2020) and “Abstracting Imperfect Information Away from Two-Player Zero-Sum Games” (Sokota et al 2023), we establish proofs and rates of convergence for the Public Belief Game, and use it to develop an improved deep RL algorithm that we test on large instances of “Liar’s Dice”, a game in the poker-family, infeasible to solve via traditional counterfactual regret minimization. We efficiently achieve near-optimal regret, a new SOTA result. Economically, this opens up the possibility of studying large models of imperfect information with learning, with strategic incentives, such as those that would occur during stock-market crashes, Federal Reserve guidance or other informational shocks.

Invited Workshops and Conferences

2022

- AreaChair for MASEC 2023 Workshop at Neurips 2023
- Reviewer, AI4ABM workshop
- Presented Aiyagari Reinforcement Learning Model at AI4ABM workshop, International Conference of Machine Learning 2022
- Attended NBER Behavioral Macro Bootcamp at UC Berkeley
- Attendee Simon’s Institute ‘Theory of Reinforcement Learning’ at UC Berkeley in series ‘Learning and Games’, Summer 2022

Honors, Awards, Achievements, Service, and Misc.

- Co-host weekly Macro Student Lunch, NYU, and Macro Reading Group 2023
- Awarded Nuffield College Fellowship for Oxford M.Phil Econ. program
- All As in Ph.D. area of concentration (Macroeconomics). All As in 2nd and 3rd year. As first semester Econometrics (Econometric theory, Causal Inference, IVs and Panel Data), second semester Microeconomics (Game theory, Auction theory and Mechanism Design.), second semester Mathematical Economics (Probability Theory, Stochastic Processes, Ergodic Theory, Measure-Preserving Dynamical System Theory)
- President of the UChicago Federal Reserve Challenge Team, won Chicago Fed Competition and Honorable Mention in National Competition at Board of Governors on the basis of a proposal I wrote involving STSI issuance.
- 2015-2016 Member of Dean's Council at University of Chicago
- Dean's list (all years), Economics Tutor (University of Chicago)
- William J. Branstrom Freshman Prize, James Angell Scholar, and Telluride House Scholar (University of Michigan)
- First student to be admitted to Ford School for Sophomore year
- Junior Scholar, ASSA Economics of National Security Association
- Awarded senior prizes for Achievement in Economics, History, and a Wide Range of Sciences; AP Scholar (Phillips Exeter)
- Bronfman Fellow
- 36/36 on ACT
- Comfortable with C++, C#, Java, Julia, Python, Matlab, Stata, R
- Have SECRET level clearance, United States Government