BIJAN MAZAHERI

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I am interested in information-theoretical questions pertaining to causality, experimental design, and artificial intelligence. I am working to apply these ideas to new computational challenges in defense and biology.

ACADEMIA

Thayer School of Engineering, Dartmouth College - Hanover, NH *Jan 2025 - Now*
Assistant Professor

Broad Institute of MIT and Harvard - Cambridge, MA
Eric and Wendy Schmidt Postdoctoral Associate *Oct 2023 - Dec 2024*
Visiting Research Scientist *Jan 2025 - Now*
Primarily advised by Prof. Caroline Uhler.

California Institute of Technology - Pasadena, CA *Oct 2017 - Aug 2023*
Doctorate of Philosophy
Computing and Mathematical Sciences, GPA: 3.9/4.0
Thesis Title: Combining Sources and Leveraging Contexts

Cambridge University - Cambridge, UK *Oct 2016 - Jun 2017*
Classes in the Mathematical Tripos Parts IA, IB, and II as part of a Herchel Smith Fellowship.

Williams College - Williamstown, MA *Sep 2012 - Jun 2016*
Bachelor of Arts
Physics and Computer Science, GPA: 3.92/4.00
Highest Honors (Physics), Phi Beta Kappa, Sigma Xi, Magna Cum Laude
Thesis Title: RNA Macrostates and Macrokinetics

INDUSTRY

Amazon Research Causality Lab - Tübingen, Germany *Oct 2022 - Feb 2023*
Applied Scientist Intern (L5)
Worked with Dr. Michaela Hardt, Dr. Atalanti Mastakouri, and Dr. Dominik Janzing

BioDiscovery - El Segundo, CA *Jun 2017 - Sep 2017*
Intern
Worked with Dr. Soheil Shams.

IBM T.J. Watson Research Center - Yorktown Heights, NY *Jun 2016 - Sep 2016*
Intern
Worked with Dr. Victor Kravets (mentor) and Dr. Andrew Sullivan (manager).

AWARDS AND GRANTS

Dartmouth Initiative for Middle East Exchange (DIMEX) *Awarded Fall 2025*
Conference Travel Grant. $22,000.

DARPA Advanced Research Concepts (Lead PI) *Awarded Summer 2025*
Critical Orientation of Mathematics for the Advancement of Science and Security. $248,000.

Eric and Wendy Schmidt Postdoctoral Fellowship *Awarded Summer 2023*
1-3 years of research at the Broad Institute of MIT and Harvard. Approximately $225,000.

Amazon AI4Science Research Fellowship *Awarded Spring 2022*
Research with the potential to aid scientific discovery. $25,000.

National Science Foundation Graduate Research Fellowship *Awarded Spring 2019*
3 year Ph.D. fellowship. Approximately $138,000.

Herchel Smith Fellowship *Awarded Spring 2016*
Funding for 1-3 years of study at Cambridge University. Approximately $100,000.

TEACHING

Dartmouth Engineering
Discrete and Probabilistic Systems *Summer 2025*
Principles of Causality *Spring 2025, 2026*

TAing
Markov Chain Monte Carlo (Caltech) *Spring 2022*
Discrete Mathematics (Williams) *Fall 2015*
Electricity and Magnetism (Williams) *Spring 2015*
Introduction to Mechanics (Williams) *Fall 2013*

PUBLICATIONS

Bijan Mazaheri, Chandler Squires, Caroline Uhler. Synthetic Potential Outcomes and Causal Mixture Identifiability. In *The 28th International Conference on Artificial Intelligence and Statistics*, 2025.

Bijan Mazaheri, Siddharth Jain, Matthew Cook, Jehoshua Bruck. Omitted Labels Induce Nontransitive Paradoxes in Causality. In *4th Conference on Causal Learning and Reasoning*, 2025.

Spencer Gordon, Eric Jahn, ***Bijan Mazaheri**, Yuval Rabani, and Leonard J Schulman. Identification of Mixtures of Discrete Product Distributions in Near-Optimal Sample and Time Complexity. *arXiv:2309.13993*, 2023. In *The Thirty Seventh Annual Conference on Learning Theory*, pp. 2071-2091. PMLR, 2024.

Bijan Mazaheri, Atalanti Mastakouri, Dominik Janzing, and Michaela Hardt. Causal Information Splitting: Engineering Proxy Features for Robustness to Distribution Shifts. In *The 39th Conference on Uncertainty in Artificial Intelligence*, 2023.

Spencer Gordon, ***Bijan Mazaheri**, Yuval Rabani, and Leonard J Schulman. Causal Inference Despite Limited Global Confounding via Mixture Models. In *2nd Conference on Causal Learning and Reasoning*, 2023.

Siddharth Jain, **Bijan Mazaheri**, Netanel Raviv, and Jehoshua Bruck. Glioblastoma signature in the DNA of blood-derived cells. *PLOS One* 16(9): e0256831. 2021.

Bijan Mazaheri, Siddharth Jain, and Jehoshua Bruck. Expert Graphs: Synthesizing New Expertise via Collaboration. In *2021 IEEE International Symposium on Information Theory (ISIT)*, pages 2447–2452, 2021.

Spencer Gordon, ***Bijan Mazaheri**, Yuval Rabani, and Leonard Schulman. Source Identification for Mixtures of Product Distributions. In *The Thirty Fourth Annual Conference on Learning Theory*, pages 2193–2216. PMLR, 2021.

Bijan Mazaheri, Siddharth Jain, and Jehoshua Bruck. Robust Correction of Sampling Bias using Cumulative Distribution Functions. *Advances in Neural Information Processing Systems*, volume 33, pages 3546–3556. Curran Associates, Inc., 2020.

* = Authorship order is alphabetical.

PREPRINTS

Mateusz Gajewski and **Bijan Mazaheri**. Data Augmentation via Causal Residual Bootstrapping. Under Review. 2025.

Bijan Mazaheri, Jiaqi Zhang, and Caroline Uhler. Faithfulness and Intervention-Only Causal Discovery. Under Review. 2025.

Bijan Mazaheri, Jiaqi Zhang, and Caroline Uhler. Meta-Dependence in Conditional Independence Testing. *arXiv:2504.12594*. Under review. 2025.

Bijan Mazaheri, Spencer Gordon, Yuval Rabani, and Leonard Schulman. Causal Discovery under Latent Class Confounding. *arXiv:2311.07454*, Under Review, 2025.

Spencer Gordon, ***Bijan Mazaheri**, Yuval Rabani, and Leonard J Schulman. The sparse Hausdorff moment problem, with application to topic models. *arXiv:2007.08101*, 2020.

Siddharth Jain, **Bijan Mazaheri**, Netanel Raviv, and Jehoshua Bruck. Cancer Classification from Healthy DNA using Machine Learning. *BioRxiv*, page 517839, 2019.

Siddharth Jain, **Bijan Mazaheri**, Netanel Raviv, and Jehoshua Bruck. Short Tandem Repeats Information in TCGA is Statistically Biased by Amplification. *BioRxiv*, page 518878, 2019.

* = Authorship order is alphabetical.

PATENTS

Siddharth Jain, **Bijan Mazaheri**, Netanel Raviv, and Jehoshua Bruck. Mutation profile and related labeled genomic components, methods and systems. 2019.

INVITED TALKS

Tshinghua Sanya International Mathematics Forum *Jan 2026*
Title: "Distribution-level Techniques for Heterogeneous Causal Relationships"

Biomedical Data Science Seminar Series at Dartmouth Medical School *Oct 2025*
Title: "Causal Underpinnings of Information Synthesis"

Williams College Statistics Colloquium *Oct 2025*
Title: "Causal Underpinnings of Information Synthesis"

Ops/MS Brown Bag Seminar, Tuck School of Business *Feb 2025*
Title: "Synthetic Potential Outcomes and Causal Mixture Identifiability"

Boston University Machine Learning Symposium *Nov 2024*
Title: "Synthetic Potential Outcomes and Causal Mixture Identifiability"

Stanford Online Causal Inference Seminar   *Oct 2024*
Title: "Synthetic Potential Outcomes and the Hierarchy of Causal Identifiability"

Jones Seminar, Thayer School of Engineering at Dartmouth   *May 2024*
Title: "Latency and Heterogeneity in Data and What to do About it"

Simon's Institute for Theory of Computing   *May 2023*
Title: "Causal Discovery under Limited Global Confounding"

RESEARCH MENTORSHIP

PhD Advisees
Zou Yang (Thayer School of Engineering, Dartmouth)
Sophia Xiao (Thayer School of Engineering, Dartmouth)

Graduate Students
Mateusz Gajewski (PhD Student, Poznań University of Technology)
Ryan Montgomery (MBA Student, Tuck School of Business, Dartmouth)

Undergraduate
Muhammad Ahmad (Dartmouth College FYREE)
Hailey King (Dartmouth College)
Ruchita Nair (Dartmouth College)
Benjamin Cavanagh (Dartmouth College)
Sreshth Tiwari (Dartmouth College URAD)
Connor Kilkenny (Dartmouth College URAD)
Titus Johnson (Dartmouth College URAD)
Leila Salken (Williams College)
Tamier Baoyin (B.A. Mt. Holyoke College, B.E. Dartmouth College)
Anika Roy (B.S. IIIT Hyderabad, Khorana Scholar, Heidelberg Future Leaders Award)
Beshr Bouli (MIT UROP)

Data Science Projects
I have supported over 30 projects with undergraduate students using data on my website, and have advised some of these students in applying to graduate school.

WORKSHOPS

Tshinghua Sanya International Mathematics Forum   *Winter 2026*
Title: Causality and Machine Learning.

Simon's Institute for Theory of Computing   *Spring 2022*
Title: Causality.

SERVICE

Conferences
CLeaR: Reviewer (2024-2026), Program Chair (2026).
NeurIPS: Reviewer (2020 - 2025), Top Reviewer Award (2025)
AISTATS: Reviewer (2023 - 2026)
ICML: Reviewer (2025)

Journals

Nature Machine Intelligence: Reviewer (2024)
The American Statistician: Reviewer (2024)
Electronic Journal of Statistics: Reviewer (2025)

Committees

Dartmouth Engineering 3-2 and 2-1-1-1 Programs
Curriculum, Dartmouth Computational Science and Modeling Program

Other Service

Faculty Advisor, Dartmouth Cross Country and Track and Field Teams
Volunteer Assistant Coach, Caltech Cross Country and Track and Field Teams
Sports statistics outreach for Cross Country and a correspondent at D3 Glory Days

PROJECTS

LACCTiC *Sep 2021 - present*

I maintain a website for collegiate cross country with 10,000 regular users that applies concepts from batch-effect correction to ranking performances on differing terrain. The backend runs on Python and Django and the frontend uses React, and the database is hosted on AWS. I have helped advise over 30 student projects using this data.