

BIJAN MAZAHERI

🌐 bijanmazaheri.com ✉ bijan.h.mazaheri@dartmouth.edu 🐙 github.com/honeybijan
📍 Hanover, NH 📞 (781)-985-0881

I study topics related to causality, distribution shift, decision fusion, and mixture models, particularly concerning combining data and knowledge from multiple places, topics, and modalities. I approach problems through a bifocal lens, with theory guiding data-realistic approaches to application and application giving rise to new fundamental discoveries.

WORK EXPERIENCE

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 worked with Prof. Caroline Uhler's Group.

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
Developed and implemented methods for genome aberration-based cancer clustering that are now integrated into BioDiscovery's software.

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).

EDUCATION

California Institute of Technology - Pasadena, CA *Oct 2017 - Aug 2023*
Doctorate of Philosophy
Computing and Mathematical Sciences, GPA: 3.9/4.0
Awarded NSF Graduate Research Fellowship and Amazon AI4Science Research Fellowship
Thesis Title: Combining Sources and Leveraging Contexts

Cambridge University (Emmanuel College) - Cambridge, UK *Oct 2016 - Jun 2017*
Mathematics Part 1B
Supported by a Herchel Smith Fellowship
Additional classes in Computer Science and Mathematics Part II

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

TEACHING

- Discrete and Probabilistic Systems (Dartmouth Engineering)** *Summer 2025*
New final project and curriculum developed.
- Principles of Causality (Dartmouth Engineering)** *Spring 2025*
New class for Dartmouth Engineering, first taught in Spring 2025.
- Markov Chain Monte Carlo (Caltech)** *Spring 2022*
Head TA for new class. Developed solutions and grading rubrics for problem sets.
- Physics and Mathematics (Williams College)** *Fall 2013- Spring 2016*
TAed for undergraduate classes in Electricity and Magnetism, Classical Mechanics, Mathematical Methods for Scientists, Premed Physics, Discrete Mathematics.

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.
- 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 awarded for a proposal to research confounding influence in causal networks.
- Herchel Smith Fellowship** *Awarded Spring 2016*
Funding for 1-3 years of study at Cambridge University.

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

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

Bijan Mazaheri, Spencer Gordon, Yuval Rabani, and Leonard Schulman. Causal Discovery under Latent Class Confounding. *arXiv:2311.07454*, 2023.

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

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| Biomedical Data Science Seminar Series at Dartmouth Medical School | <i>Oct 2025</i> |
| Title: “Causal Underpinnings of Information Synthesis” | |

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| Williams College Statistics Colloquium | <i>Oct 2025</i> |
| Title: “Causal Underpinnings of Information Synthesis” | |

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| Ops/MS Brown Bag Seminar, Tuck School of Business | <i>Feb 2025</i> |
| Title: “Synthetic Potential Outcomes and Causal Mixture Identifiability” | |

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| Boston University Machine Learning Symposium | <i>Nov 2024</i> |
| Title: “Synthetic Potential Outcomes and Causal Mixture Identifiability” | |

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| Stanford Online Causal Inference Seminar | <i>Oct 2024</i> |
| Title: “Synthetic Potential Outcomes and the Hierarchy of Causal Identifiability” | |

Jones Seminar, Thayer School of Engineering at Dartmouth
Title: “Latency and Heterogeneity in Data and What to do About it”

May 2024

Simon’s Institute for Theory of Computing
Title: “Causal Discovery under Limited Global Confounding”

May 2023

SERVICE

Program Chair, Conference in Causal Learning and Reasoning.

April 2026

Reviewer for ICML, NeurIPS (Top Reviewer Award in 2025), AISTATS, CLeaR, The American Statistician, and Nature Machine Intelligence.

Sports statistics outreach for Cross Country and a correspondent at D3 Glory Days.

MENTORSHIP

PhD Students

Summer 2025 - present

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

Undergraduate

Summer 2024 - present

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

Sep 2019 - present

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 ATTENDED

Simon’s Institute for Theory of Computing: Causality
4 week workshop on Causal inference methods.

Spring 2022

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 20 student projects using this data.