

Jessy (Xinyi) Han | Curriculum Vitae

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Research Interests

Developing methods in causal inference & survival analysis to enable *when-if* decisions, with applications in healthcare, policy evaluation (criminal justice), and business.

Education

Massachusetts Institute of Technology, IDSS/LIDS

Cambridge, MA

Ph.D. in Social & Engineering Systems and Statistics, GPA – 5.0/5.0

Sep 2020–May 2026 (expected)

Fellowship (2024-2025): Google-MIT Schwarzman College of Computing Fellow (five recipients at MIT)

Fellowship (2020-2021): Michael Hammer Society of Fellows

Advisors: Dr. Fotini Christia and Dr. Devavrat Shah

Columbia University

New York, NY

B.S. in Computer Science, GPA – 4.10/4.0

Sep 2016–May 2020

Double minor in Applied Mathematics and Economics

Graduation honors: Summa Cum Laude, Russell C. Mills Award

Advisors: Dr. Augustin Chaintreau and Dr. Ana-Andreea Stoica

Research Projects

Methodology

Synthetic Survival Control (SSC) Method: Developed a tensor-based causal survival analysis framework to estimate counterfactual hazard trajectories under interventions; designed scalable estimation procedures for confounded, sparse, and censored time-to-event data [1]

Universal Time Series Embeddings: Developed novel time series embeddings for new architectures of foundation models for time series data [13]

Application: Healthcare

Causal Survival Analysis for T-Cell Lymphoma: Collaborated with Massachusetts General Hospital and the PETAL consortium; built a prognostic risk assessment tool [2]; evaluated treatment choice [1] and sequencing effects [3], informing clinical decision-making

Application: Policy Evaluation for Criminal Justice

Racial Disparities in Time-to-Recidivism: Applied causal time-to-event framework to COMPAS recidivism data with IBM Research; uncovered long-term racial disparities suggesting a link to structural inequalities and informed holistic policy design [11]

Effect of Body-Worn Cameras (BWCs): Analyzed BWC data across 2,000+ police departments, revealing fewer low-level arrests, reduced assaults on officers, and deterrence of some fatalities, but increased violent crime reports, highlighting heterogeneous impacts on policing and safety [12]

Calls-for-Service as a Source of Bias: Developed a causal framework using 22M 911 calls and 400k stops from NYC, Seattle, and New Orleans to quantify racial bias in upstream police–civilian interactions [10]

Application: Business Decisions

Causal Survival Analysis for Customer Churn Modeling: Collaborating with Generali to model churn hazard trajectories under price changes and claims to inform pricing strategies

INFORMS Job Talk

- **When-If Decisions from Data** (10/27 5:15-5:30pm Building A Level 4 A410, original title: When Survival Meets Causal: A Framework for Decision Making on Time-to-Event Outcomes)

Publications

Methodology

- [1] *Synthetic Survival Control: A Tensor Framework for Causal Survival Analysis.*

Jessy Xinyi Han, Devavrat Shah.

Submitted to AISTATS, 2025.

Application: Healthcare

- [2] *Global Outcomes and Prognosis for Relapsed/Refractory Mature T-Cell and NK-Cell Lymphomas: Results from the PETAL Consortium.*

Jessy Xinyi Han*, Min Jung Koh*, Leora Boussi*, et al. (* equal contribution) (PI: Devavrat Shah, Salvia Jain).

Blood Advances, 9(3):583–602, 2025.

- Highlighted by a special commentary from Qu Jiang and Marco Herling: [PETAL: a Global View on R/R T-/NK-Lymphoma Treatment Reality](#).

- [3] *Forecasting Optimal Treatments in Relapsed/Refractory Mature T- and NK-Cell Lymphomas: A Global PETAL Consortium Study.*

Mark N. Sorial, Jessy Xinyi Han, Min Jung Koh, et al. (PI: Devavrat Shah, Salvia Jain).

British Journal of Haematology, 206(6):1664–1677, 2025.

- [4] *Early Time-to-Relapse as a Survival Prognosticator in Mature T-Cell/NK-Cell Lymphomas: Results from the PETAL Consortium.*

Mark N. Sorial, Kenechukwu N. Aniagboso, Emily Buttermore, Matthew M. Lei, Ellen K. Kendall, Kristiana Nasto, Min Jung Koh, Makoto Iwasaki, Jessy Xinyi Han, et al. (PI: Devavrat Shah, Salvia Jain).

Blood, accepted for publication, 2025.

- [5] *Development of a Novel Prognostic Score for Relapsed/Refractory Mature T-Cell and NK-Cell Lymphomas (PIRT): Results from a Global Peripheral T-Cell Lymphoma (PETAL) Consortium.*

Min Jung Koh, Jessy Xinyi Han, Leora Boussi, et al. (PI: Devavrat Shah, Salvia Jain).

Blood, 144(Suppl 1):465, 2024.

- Accepted for presentation at the 2024 American Society of Hematology Annual Meeting.

- [6] *Leveraging a Novel Machine Learning Method to Predict Outcomes in Latin American (LATAM) Patients with Newly Diagnosed T and NK Cell Lymphomas.*

Maria J. J. Fernandez Turizo, Jessy Xinyi Han, et al. (PI: Devavrat Shah, Salvia Jain).

Blood, 144:7515, 2024.

- Accepted for presentation at the 2024 American Society of Hematology Annual Meeting.

- [7] *Impact of Therapy Sequence on Survival Outcomes among Patients with Relapsed or Refractory Mature T and NK Cell Neoplasms: A Global Retrospective Cohort Study.*

Mark N. Sorial, Min Jung Koh, Leora Boussi, Jessy Xinyi Han, et al. (PI: Devavrat Shah, Salvia Jain).

Blood, 142:3080, 2023.

- Accepted for presentation at the 2023 American Society of Hematology Annual Meeting.

- [8] *Novel Causal Inference Method Estimates Treatment Effects of Contemporary Drugs in a Global Cohort of Patients with Relapsed and Refractory Mature T-Cell and NK-Cell Neoplasms.*

Min Jung Koh, Leora Boussi, Jessy Xinyi Han, et al. (PI: Devavrat Shah, Salvia Jain).

Blood, 142:1703, 2023.

- Accepted for presentation at the 2023 American Society of Hematology Annual Meeting.

- [9] *Incorporation of Machine Learning Tools to Predict Global Outcomes for Patients with Relapsed and Refractory*

Peripheral T and NK/T-Cell Lymphomas in the Contemporary Era.

Leora S. Boussi, Min Jung Koh, **Jessy Xinyi Han**, et al. (PI: Salvia Jain).

Blood, 140(Suppl 1):10976–10978, 2022.

- Accepted for presentation at the 2022 American Society of Hematology Annual Meeting.

Application: Policy Evaluation for Criminal Justice.....

[10] *A Causal Framework to Evaluate Racial Bias in Law Enforcement Systems.*

Jessy Xinyi Han, Andrew Cesare Miller, S. Craig Watkins, Christopher Winship, Fotini Christia, Devavrat Shah.

Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society (AIES), 2024.

- Accepted for oral presentation at the 2024 ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO).

[11] *Fairness Is More Than Algorithms: Racial Disparities in Time-to-Recidivism.*

Jessy Xinyi Han, Kristjan Greenewald, Devavrat Shah.

In preparation for submission to *Nature Communications*.

- Selected for presentation at NeurIPS 2025 ML×OR Workshop: Mathematical Foundations and Operational Integration of Machine Learning for Uncertainty-Aware Decision-Making.

- Selected for presentation at ACM SIGMETRICS 2025 Causal Inference Workshop.

[12] *Nationwide Effects of Body-Worn Cameras on Police Behavior, Safety, and Racial Disparities.*

Timur Abbiasov*, **Jessy Xinyi Han***, Fabio Duarte, Paolo Santi, Carlo Ratti, Fotini Christia. (* equal contribution)

Submitted to *Scientific Reports*, 2025.

Others.....

[13] *Towards Efficient Foundation Model: A Novel Time Series Embedding.*

Jessy Xinyi Han, Arth Dharaskar, Nathaniel Lanier, Abdullah Omar Alomar, Aditya Agrawal, Angela Yuan, Jocelyn Hsieh, Ishan Shah, Muhammad Jehangir Amjad, Devavrat Shah.

- Selected for presentation at NeurIPS 2025 ML×OR Workshop: Mathematical Foundations and Operational Integration of Machine Learning for Uncertainty-Aware Decision-Making.

[14] *Chasm in Hegemony: Explaining and Reproducing Disparities in Homophilous Networks.*

Yiguang Zhang, **Jessy Xinyi Han**, Ilica Mahajan, Priyanjana Bengani, Augustin Chaintreau. *SIGMETRICS*, 2021.

[15] *Seeding Network Influence in Biased Networks and the Benefits of Diversity.*

Ana-Andreea Stoica, **Jessy Xinyi Han**, Augustin Chaintreau.

The Web Conference WWW (oral presentation), 2020.

Selected Talks and Posters

Causal Survival Analysis

- MIT Corporation Visiting Committee — Cambridge, MA (Nov 18, 2025)
- INFORMS Annual Meeting — Atlanta, GA (Oct 27, 2025)
- Cornell Young Researchers Workshop — Ithaca, NY (Oct 10, 2025)
- Generali Visit to MIT — Cambridge, MA (Oct 8, 2025)
- MIT Schwarzman College of Computing Reception — Cambridge, MA (Apr 12, 2024)
- Invitation-only event for Steve Schwarzman, MIT Corporation, and distinguished donors — Cambridge, MA (Apr 12, 2024)
- MIT-IBM Watson AI Lab Demos — Cambridge, MA (Mar 1, 2024)

Debiased What-If Decision-Making in Criminal Justice and Life Science

- Women in Data Science (WiDS) Cambridge 2025 — Cambridge, MA (Mar 7, 2025)
- EAAMO Doctoral Consortium — San Luis Potosi, Mexico (Oct 30, 2024)

Fairness Is More Than Algorithms: Racial Disparities in Time-to-Recidivism

- Initiative on Combatting Systemic Racism (ICSR) Roundtable — Pathways to Racial Equity: Research, Education & Entrepreneurship — Cambridge, MA (Oct 10, 2024)

Nationwide Effects of Body-Worn Cameras on Police Behavior, Safety, and Racial Disparities

- ICSR Lunch Seminar — Cambridge, MA (Oct 19, 2024)

A Causal Framework to Evaluate Racial Bias in Law Enforcement Systems

- ICSR Lunch Seminar — Cambridge, MA (Apr 4, 2024)

Global Outcomes and Prognosis for Relapsed/Refractory Mature T-Cell and NK-Cell Lymphomas

- MIT-MGB AI Cures Conference — Cambridge, MA (Apr 24, 2023)

Media Coverage

IBM: [Watson AI Lab 2024 Annual Report](#).

Blood Cancers Today: [PETAL Consortium unveils novel scoring system for T-cell lymphoma](#).

MIT News: [Empowering systemic racism research at MIT and beyond](#).

MIT Press: [An MIT Exploration of Generative AI: Advancing Equality: Harnessing Generative AI to Combat Systemic Racism](#).

Amazon AWS YouTube: [The Grad Project: How MIT students are combating systemic racism with Python and data analysis](#).

Awards

2024–2025: Google-MIT Schwarzman College of Computing Fellow (five recipients at MIT)

2020–2021: Michael Hammer Society of Fellows

2020: Honorable Mention, Outstanding Undergraduate Researcher

Professional Service

Mentor: MIT SES Graduate Application Assistance Program (GAAP) for Underrepresented Groups (2020, 2021, 2022)

Reviewer: WWW 2023, The Oncologist, AIES 2025, EAAMO 2025, AISTATS 2026

Session Organizer: MIT LIDS Seminar 2025

Open Source Software & Data Resources

Open Data Hub for Policing: Designed and maintained an open-data hub to make 911 call and stop datasets publicly accessible for research on policing disparities.

Causal Inference (Panel Data) Package: Prototype Python package for synthetic interventions and related panel-data causal estimation.

Teaching

MIT: 6.7810 Algorithms for Inference (Fall 2022)

Columbia University: COMS E6998 Social Networks (Spring 2020)

Columbia University: COMS 3203 Discrete Mathematics (Head TA, Fall 2019; TA, 2017–2019)

Additional Professional Experience

Ikigai Labs (Machine Learning Intern, 2025): Built a What-If demand forecasting template app for scenario planning in business.

IBM Research (Research Intern, 2024): Collaborated on the time-to-recidivism project.

Google Ads Risk Engine (Software Engineer Intern, 2019): Designed and implemented improved

anomaly detection models; achieved higher AUROC and reduced suspension time by 13 minutes on production data.

Google Fuchsia OS (Engineering Practicum Intern, 2018): Instrumented storage devices and analyzed traces; built deterministic latency models with 99.77% predictive accuracy.