

Miruna Oprescu

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Research Interests

Themes: Trustworthy AI, causal inference, learning and decision-making under uncertainty.

Methods: Statistical machine learning, reinforcement learning, sequential learning and inference, robust estimation and uncertainty quantification.

Applications: Healthcare, climate and Earth systems, neuroscience, energy and industrial systems.

Academic Appointments

Stony Brook University

Sep 2026 – Present

SUNY PRODiG+ Fellow, Department of Computer Science

- Building TILDE Lab: **T**rustworthy **I**nference, **L**earning, **D**ecision-making, and **E**valuation.
- Planned tenure-track transition to Assistant Professor in 2028 following successful review.

Education

Cornell University (Cornell Tech)

2021 – 2026

Ph.D. in Computer Science. Advisor: Nathan Kallus

M.S. in Computer Science (2024, awarded en route to Ph.D.)

Department of Energy Computational Science Graduate Fellow

Harvard University

2011 – 2015

Joint A.B. degree in Physics and Mathematics. Minor in Computer Science

Cum laude in field with High Honors in Physics and Mathematics

Selected Publications

† equal contribution, ‡ alphabetical authors. Full publication list available on [Google Scholar](https://scholar.google.com/citations?user=mirunaoprescu).

Preprints

- [1] Maresa Schröder, **Miruna Oprescu**, Stefan Feuerriegel, and Nathan Kallus. Causal inference on networks under misspecified exposure mappings: A partial identification framework. *arXiv preprint arXiv:2602.03459*, 2026.

Conference and Journal Publications

- [1] Ayush Khot[†], **Miruna Oprescu**[†], Maresa Schröder, Ai Kagawa, and Xihai Luo. Spatial deconfounder: Interference-aware deconfounding for spatial causal inference. In *International Conference on Machine Learning*. PMLR, 2026.
- [2] Miruna Oprescu, Brian Cho, and Nathan Kallus. Efficient adaptive experimentation with noncompliance. *Advances in Neural Information Processing Systems*, 38:42462–42498, 2026.
- [3] Miruna Oprescu, David Park, Xihai Luo, Shinjae Yoo, and Nathan Kallus. Gst-unet: A neural framework for spatiotemporal causal inference with time-varying confounding. *Advances in Neural Information Processing Systems*, 38:17295–17322, 2026.
- [4] **Miruna Oprescu** and Nathan Kallus. Estimating heterogeneous treatment effects by combining weak instruments and observational data. *Advances in Neural Information Processing Systems*, 37:118777–118806, 2025.

- [5] Andrew Bennett, Nathan Kallus, **Miruna Oprescu**[†], Wen Sun, and Kaiwen Wang[†]. Efficient and sharp off-policy evaluation in robust markov decision processes. *Advances in Neural Information Processing Systems*, 37:112962–113000, 2025.
- [6] Andrew Bennett[†], Nathan Kallus[†], and **Miruna Oprescu**[†]. Low-rank mdps with continuous action spaces. In *International Conference on Artificial Intelligence and Statistics*, pages 4069–4077. PMLR, 2024.
- [7] **Miruna Oprescu**, Jacob Dorn, Marah Ghoummaid, Andrew Jesson, Nathan Kallus, and Uri Shalit. B-learner: Quasi-oracle bounds on heterogeneous causal effects under hidden confounding. In *International Conference on Machine Learning*, pages 26599–26618. PMLR, 2023.
- [8] Nathan Kallus[†] and **Miruna Oprescu**[†]. Robust and agnostic learning of conditional distributional treatment effects. In *International Conference on Artificial Intelligence and Statistics*, pages 6037–6060. PMLR, 2023.
- [9] Keith Battocchi[‡], Eleanor Dillon[‡], Maggie Hei[‡], Greg Lewis[‡], **Miruna Oprescu**[‡], and Vasilis Syrgkanis[‡]. Estimating the long-term effects of novel treatments. *Advances in Neural Information Processing Systems*, 34:2925–2935, 2021.
- [10] **Miruna Oprescu**[†], Vasilis Syrgkanis[†], and Zhiwei Steven Wu[†]. Orthogonal random forest for causal inference. In *International Conference on Machine Learning*, pages 4932–4941. PMLR, 2019.
- [11] Vasilis Syrgkanis, Victor Lei, **Miruna Oprescu**, Maggie Hei, Keith Battocchi, and Greg Lewis. Machine learning estimation of heterogeneous treatment effects with instruments. *Advances in Neural Information Processing Systems*, 32:15193–15202, 2019. **Spotlight presentation.**
- [12] **Miruna Oprescu**[†], Vasilis Syrgkanis[†], Keith Battocchi[†], Maggie Hei[†], and Greg Lewis[†]. EconML: A Machine Learning Library for Estimating Heterogeneous Treatment Effects. In *CausalML Workshop, NeurIPS*, 2019. **Spotlight presentation.**

Research and Work Experience

Machine Learning Research Intern

Summers 2022, 2025

Netflix

- **2025, New York City:** Developed a structural causal model of subscription choice using quasi-experimental plan migration to estimate plan value, price sensitivity, and switching costs. Mentors: David Hubbard, Yonatan Gur.
- **2022, Los Gatos:** Developed causal ML methods combining weak instruments and observational data to estimate the effect of novel content on engagement [4]. Mentors: Sudeep Das, Aish Fenton.

Research Intern

Summer 2024

Brookhaven National Laboratory, Brookhaven, NY

- Developed GST-UNet [3], a neural framework for spatiotemporal causal inference under time-varying confounding, integrating UNet architectures with iterative G-computation to estimate intervention effects in environmental and health applications. Mentor: Shinjae Yoo.

Senior Data and Applied Scientist

2017 – 2021

Microsoft Research, Cambridge, MA

- Conducted research in causal machine learning, developing methods for heterogeneous treatment effect estimation and policy evaluation, with results published at top venues [9, 10, 11, 12].
- Founded and maintained the open-source [EconML](#) library, implementing production-scale causal

inference algorithms now widely used in industry and academia.

- Collaborated on projects in subseasonal weather forecasting and cancer modeling, applying ML techniques to real-world scientific data.

Software Development Engineer

2015 – 2017

Microsoft, Cambridge, MA

- Developed scalable, distributed machine learning algorithms as a core contributor to [MMLSpark](#), Microsoft's open-source ML library for Apache Spark.

Invited Talks

<i>Causal Inference for Spatiotemporal Interventions</i>	2025
SIAM Conference on Computational Science and Engineering	
<i>Reliable Treatment Effect Estimation Using Weak Instruments and Observational Data</i>	2024
Workshop in Operations Research and Data Science (WORDS), Duke University	
<i>Uncertainty Quantification in Causal Inference: Sharp and Efficient Bounds on Heterogeneous Causal Effects Under Hidden Confounding</i>	2023
Brookhaven National Laboratory	
<i>Causal Inference and Machine Learning in Practice with EconML and CausalML</i>	2021
SIGKDD	
<i>EconML: A Machine Learning Library for Estimating Heterogeneous Treatment Effects</i>	2019
Open Data Science Conference East	

Honors & Awards

Department of Energy Computational Science Graduate Fellowship	2022–2026
DOE Communicate Your Science & Engineering (CYSE) Award	2025
Meta Ph.D. Research Fellowship Finalist	2022
<i>Cum laude</i> , Harvard University; High Honors in Physics and Mathematics	2015
Derek C. Bok Award for Distinction in Teaching (Data Science), Harvard	2014

Teaching

Teaching Assistant, Cornell University	2021–2022
◦ Learning, Inference, and Decision Making from Data (Spring 2022)	
◦ Applied Machine Learning (Fall 2021)	
Teaching Fellow, Harvard University	2012–2014
Physics, Data Science, and Mathematics courses; recipient of the Derek C. Bok Award for Distinction in Teaching.	

Professional Service

Director, Summer Science Program (SSP)	2023–Present
Reviewer: NeurIPS (Top Reviewer Award, 2025), ICML, AISTATS	2021–Present