CHRISTOPHER HARSHAW

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ACADEMIC APPOINTMENTS

Columbia University Fall 2024 - Current
Assistant Professor, Statistics Department *New York City, NY*

UC Berkeley and MIT (joint) Summer 2022 - Summer 2024
Postdoctoral Fellow, Foundations of Data Science (FODSI) *Berkeley, CA and Boston, MA*

UC Berkeley, Simons Institute for Theory of Computing Spring 2022
Postdoctoral Fellow, Causality Program *Berkeley, CA*

EDUCATION

Yale University *August 2016 - December 2021*
Ph.D. in Computer Science
Dissertation: Algorithmic Advances for the Design and Analysis of Randomized Experiments
Advisors: Daniel Spielman, Amin Karbasi

Rice University *August 2012 - May 2016*
B.S. in Electrical and Computer Engineering
B.A. in Computational and Applied Mathematics

GRANTS

Riksbankens Jubileumsfond, 2025–2027. SEK 3,122,255. As co-PI with Fredrik Sävje.

NSF Methodology, Measurement, and Statistics (MMS-2316335) "A Design-based Riesz Representation Estimation Approach for Randomized Experiments". 2024 - 2027. USD 500,000. As co-PI with Fredrik Sävje.

PUBLICATIONS

Preprints and Working Papers

· *A Design-Based Minimax Theory for Network Experiments*
Vardis Kandiros, Christopher Harshaw, and Fredik Sävje.
arXiv 2608.04909. 2026.

· *On the Impossibility of Specification Testing of Interference Models Based on Exposure Mappings*
Chao Gao, and Christopher Harshaw, Fredrik Sävje, and Yitan Wang.
arXiv 2605.09726. 2026.

· *Sigmoid-FTRL: Design-Based Adaptive Neyman Allocation for AIPW Estimators*
Fangyi Chen, Shu Ge, Jian Qian, and Christopher Harshaw.
arXiv 2511.19905. 2025.

· *Valid Inference when Testing Violations of Parallel Trends for Difference-in-Differences*
Jonas M. Mikhaeil and Christopher Harshaw.
arXiv 2510.26470. 2025.

· *A General Design-Based Framework and Estimator for Randomized Experiments*
Christopher Harshaw, Yitan Wang, and Fredrik Sävje.
arXiv 2210.08698. 2022.
Best Paper Award at NeurIPS 2022 causal inference workshop, CML4Impact.

Academic Publications

· *The Conflict Graph Design: Estimating Causal Effects under Arbitrary Neighborhood Interference*
Vardis Kandiros, Charilaos Pipis, Constantinos Daskalakis, and Christopher Harshaw.
Annals of Statistics. To appear.

· *Optimized Variance Estimation Under Interference and Complex Experimental Designs*
Christopher Harshaw, Joel Middleton, and Fredrik Sävje.
Journal of the American Statistical Association. 2026.

· *Why are RCTs the Gold Standard? The Epistemological Difference Between Randomized Experiments and Observational Studies*
Christopher Harshaw.
Invited Comment in Observational Studies. 2025.

· *Balancing Covariates in Randomized Experiments with the Gram–Schmidt Walk Design*
Christopher Harshaw, Fredrik Sävje, Daniel Spielman, and Peng Zhang.
Journal of the American Statistical Association. 2023.

· *Clip-OGD: An Experimental Design for Adaptive Neyman Allocation in Sequential Experiments*
Jessica Dai, Paula Gradu, and Christopher Harshaw.
NeurIPS 2023. **Spotlight Presentation**.

· *Design and Analysis of Bipartite Experiments Under a Linear Exposure-Response Model*
Christopher Harshaw, Fredrik Sävje, David Esienstat, Vahab Mirrokni, and Jean Pouget-Abadie.
Electronic Journal of Statistics. 2023.

· *How Do You Want Your Greedy: Simultaneous or Repeated?*
Moran Feldman, Christopher Harshaw, and Amin Karbasi.
Journal of Machine Learning Research. 2023.

· *The Power of Subsampling in Submodular Maximization*
Christopher Harshaw, Ehsan Kazemi, Moran Feldman, and Amin Karbasi.
Mathematics of Operations Research. 2021.

· *Submodular Maximization Beyond Non-negativity: Guarantees, Fast Algorithms, and Applications*
Christopher Harshaw, Moran Feldman, Justin Ward, and Amin Karbasi.
ICML 2019.

· *Projection-Free Online Optimization with Stochastic Gradient: From Convexity to Submodularity*
Lin Chen, Christopher Harshaw, Hamed Hassani, and Amin Karbasi.
ICML 2018.

· *Greed is Good: Near-Optimal Submodular Maximization via Greedy Optimization*
Moran Feldman, Christopher Harshaw, and Amin Karbasi.
COLT 2017.

· *Graph Prints: Towards a Graph Analytic Method for Network Anomaly Detection*
Christopher Harshaw, Robert A. Bridges, Michael D. Iannacone, Joel W. Reed, John R. Goodall.
CISRC 2016. **Best Paper Award**.

INVITED TALKS

A Design-Based Minimax Theory for Network Experiments

- Fall 2026, Columbia University, Student Seminar
- Fall 2026, Online Causal Inference Seminar (hosted by Stanford)
- Fall 2026, Brown University, Economics Seminar
- Fall 2026, Yale University, Institute for Quantitative Social Science
- Fall 2026, Harvard University, Center of Mathematical Sciences and Applications

The Conflict Graph Design: Estimating Causal Effects Under Interference

- Fall 2025, NeurIPS Workshop "Reliable ML from Unreliable Data"
- Spring 2025, University of Chicago Booth School of Business, Statistics and Econometrics Seminar
- Fall 2024, University of Wisconsin, Madison, Statistics Seminar
- Fall 2024, University of Maryland, College Park, Statistics Seminar
- Fall 2024, MIT, Statistics and Stochastics Seminar
- Fall 2024, Columbia University, Student Seminar (Statistics Department)
- Fall 2024, Columbia University, Causal Inference Seminar (Mailman School of Public Health)
- Summer 2024, BIRS Workshop "Causal Inference and Network Prediction"

Algorithm Design for Randomized Experiments

- Spring 2024, USC Marshall
- Spring 2024, UC Davis
- Spring 2024, Carnegie Mellon University
- Spring 2024, Rice University
- Spring 2024, Harvard University
- Spring 2024, University of Texas, Austin
- Spring 2024, University of Wisconsin, Madison
- Spring 2024, Columbia University

Clip-OGD: An Experimental Design for Adaptive Neyman Allocation in Sequential Experiments

- Fall 2023, MIT, Algorithms and Complexity Seminar
- Fall 2023, Online Causal Inference Seminar (hosted by Stanford)
- Fall 2023, University of Washington, Statistics Seminar
- Fall 2023, Yale University, Statistics and Data Science Seminar
- Summer 2023, TTIC, TRIPODS Postdoc Workshop

A Design-Based Framework for Randomized Experiments with Riesz Estimation

- Fall 2023, Stanford, Econometrics Seminar
- Spring 2023, Simons Institute, Causality Reunion
- Spring 2023, Stanford, RAIN Seminar
- Spring 2023, Columbia, Causal Inference Seminar (Mailman School of Public Health)
- Spring 2023, Yale, Human Nature Lab
- Spring 2023, UC Berkeley, Methods Workshop (Political Science Department)

Balancing Covariates in Randomized Experiments with the Gram–Schmidt Walk Design

- Spring 2022, Simons Institute, Causality Program
- Fall 2020, ETH Zurich, Computer Science Theory Group

Optimized Variance Estimation Under Interference and Complex Designs

- Spring 2022, UC Berkeley, Causal Inference Group

Interference in Randomized Experiments: Survey and Challenges

- Summer 2022, INRIA, Social Data Team

AWARDS

2018 Theres and Dennis M. Rohan Fellowship Fund

2016 NSF Graduate Research Fellowship

2016 Excellence in Capstone Engineering Design

2015 Chevron Scholarship, awarded by Rice CAAM Department

2014 Chevron Scholarship, awarded by Rice ECE Department

2012 Rice University Trustee Distinguished Scholarship

TEACHING EXPERIENCE

GR8101 *Design and Analysis of Complex Experiments*, Columbia Statistics	Spring 2025
6.S896, *Algorithmic Statistics*, Guest Lecturer, MIT	Fall 2023
Directed Reading Program, *Algorithmic Discrepancy Theory*, Yale Math Department	Fall 2020
Directed Reading Program, *Submodular Optimization*, Yale Math Department	Fall 2019
CPSC 561, *Spectral Graph Theory*, Teaching Assistant, Yale University	Fall 2018
CPSC 366, *Intensive Algorithms*, Teaching Assistant, Yale University	Spring 2018
CBB 555, *Machine Learning for Biology*, Teaching Assistant, Yale University	Fall 2017
ELEC 301 *Introduction to Signals and Systems*, Rice University	Fall 2015
ELEC 241 *Fundamentals of Electrical Engineering I*, Rice University	Fall 2014

OPEN SOURCE SOFTWARE

`GSWDesign.jl`: A Julia package containing fast implementation to sample from the Gram–Schmidt Walk Design. Features an accompanying R package. `https://github.com/crharshaw/GSWDesign.jl`.

`SubmodularGreedy.jl`: A Julia package containing fast implementations of greedy-based methods for constrained submodular optimization. `https://github.com/crharshaw/SubmodularGreedy.jl`.

SERVICE

Academic Organizing
2025 ACIC, Abstract Concurrent Session "Frontiers in Design-Based Inference: Experiments, Interference, and Interpretations"
2024 INFORMS, Invited Session "Algorithm Design for Randomized Experiments"
2023 Joint Statistical Meetings, Invited Program "New Directions in Causal Inference"
2023 INFORMS, Invited Session "Algorithm Design for Causal Inference"

Reviewing
Journal Reviewer: Annals of Statistics, Annals of Applied Statistics, Canadian Journal of Statistics, Journal of American Statistical Association, Journal of Causal Inference, Journal of Computational &

Graphical Statistics, Journal of Royal Statistical Society Series A, Journal of Statistical Computation and Simulation, Proceedings of the National Academy of Sciences
Conference Reviewer: NeurIPS (2023-2019), ICML (2023-2019), UAI (2023-2022), AISTATS (2021-2019) AAAI (2021-2020) ICLR 2021, SODA 2020, ESA 2021, WAOA 2020.

Campus Involvement

Head Graduate Affiliate at Silliman College, Yale University — Fall 2017 - Spring 2021
President, Stuttering at Yale (SAY) — Fall 2020 - Fall 2021

WORK EXPERIENCE

Google Research — Summer 2020 - Fall 2021
Student Researcher — *New York City, NY*

· Developed new estimators and experimental designs for bipartite experiments. Hosted by Jean Pouget-Abadie in the Omega Group.

Nokia Bell Laboratories — Summer 2017
Summer Intern — *Holmdel, NJ*

· Studied graph-based active learning algorithms. Hosted by Dan Kushnir.

OpenDNS (now Cisco) — Summer 2016
Research Intern — *San Francisco, CA*

· Used clustering and other graph analysis techniques to reveal previously unidentified malicious activity and identified known trends. Hosted by Dhia Mahjoub in the Cyber Security Research Group.

Oak Ridge National Laboratory — Summer 2015
DHS-Stem Intern — *Knoxville, TN*

· Developed and implemented a contextual, model-free, multi-scale anomaly detection method for evolving network data. Hosted by Robert Bridges in the Cyber and Information Research Sciences Group.