

# CHRISTOPHER HARSHAW

1255 Amsterdam Ave ◊ New York City, NA 10027

214 · 907 · 3191 ◊ c.harshaw@columbia.edu

<https://www.chrisharshaw.com/>

## ACADEMIC APPOINTMENTS

---

<b>Columbia University</b> <i>Assistant Professor, Statistics Department</i>	Fall 2024 - Current New York City, NY
<b>UC Berkeley and MIT (joint)</b> <i>Postdoctoral Fellow, Foundations of Data Science (FODSI)</i>	Summer 2022 - Summer 2024 Berkeley, CA and Boston, MA
<b>UC Berkeley, Simons Institute for Theory of Computing</b> <i>Postdoctoral Fellow, Causality Program</i>	Spring 2022 Berkeley, CA

## EDUCATION

---

<b>Yale University</b> Ph.D. in Computer Science Dissertation: Algorithmic Advances for the Design and Analysis of Randomized Experiments Advisors: Daniel Spielman, Amin Karbasi	<i>August 2016 - December 2021</i>
<b>Rice University</b> B.S. in Electrical and Computer Engineering B.A. in Computational and Applied Mathematics	<i>August 2012 - May 2016</i>

## GRANTS

---

NSF MMS-2316335 “A Design-based Riesz Representation Estimation Approach for Randomized Experiments”. 9/1/24-8/31/27. co-PI with Fredrik Sävje.

## PUBLICATIONS

---

### Preprints and Working Papers

- *The Conflict Graph Design: Estimating Causal Effects under Arbitrary Neighborhood Interference*  
Vardis Kandiros, Charilaos Pipis, Constantinos Daskalakis, and Christopher Harshaw.  
arXiv 2411.10908. 2024.
- *A Design-Based Riesz Representation Framework for Randomized Experiments*  
Christopher Harshaw, Yitan Wang, and Fredrik Sävje.  
arXiv 2210.08698. 2022.  
**Best Paper Award at NeurIPS 2022 causal inference workshop, CML4Impact.**
- *Optimized Variance Estimation Under Interference and Complex Experimental Designs*  
Christopher Harshaw, Joel Middleton, and Fredrik Sävje.  
arXiv 2112.01709. 2021.

### Academic Publications

- *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.
- *Greedy 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

---

### *The Conflict Graph Design: Estimating Causal Effects Under Interference*

- 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 2023, Columbia, Student Seminar (Statistics Department)
- Fall 2024, Columbia, 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, Stanford, Online Causal Inference Seminar
- Fall 2023, University of Washington, Statistics Seminar
- Fall 2023, Yale, 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

---

6.S896, <i>Algorithmic Statistics</i> , Guest Lecturer, MIT	Fall 2023
Directed Reading Program, <i>Algorithmic Discrepancy Theory</i> , Yale Math Department	Fall 2020
Directed Reading Program, <i>Submodular Optimization</i> , Yale Math Department	Fall 2019
CPSC 561, <i>Spectral Graph Theory</i> , Teaching Assistant, Yale University	Fall 2018
CPSC 366, <i>Intensive Algorithms</i> , Teaching Assistant, Yale University	Spring 2018
CBB 555, <i>Machine Learning for Biology</i> , Teaching Assistant, Yale University	Fall 2017
ELEC 301 <i>Introduction to Signals and Systems</i> , Rice University	Fall 2015

**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**

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.