

# Razieh Nabi

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✉ razieh.nabi@emory.edu

## Research Interests

Causal Inference, Missing Data, Algorithmic Fairness, Semiparametric Statistics, Graphical Models, Machine Learning

## Employment

**Rollins Assistant Professor** Since July 2021  
Department of Biostatistics and Bioinformatics  
Rollins School of Public Health  
Emory University, Atlanta, GA, USA

## Education

**Johns Hopkins University**, Baltimore, MD, USA Sept. 2016 - May 2021  
Ph.D. in Computer Science  
Advisor: Ilya Shpitser  
Thesis: *Causal Inference Methods for Bias Correction in Data Analyses*

**Harvard University**, Boston, MA, USA Sept. 2019 - Oct. 2019  
Visiting Scholar  
Host: James Robins  
Department of Epidemiology, School of Public Health

**University of Texas**, El Paso, Texas, USA Jan. 2015 - Aug. 2016  
M.Sc. in Statistics  
Advisor: Xiaogang Su  
Thesis: *coxphMIC: R Package for Sparse Estimation of Cox Proportional Hazards Models*

**Istanbul Sehir University**, Istanbul, Turkey Sept. 2013 - Jan. 2015  
M.Sc. in Electronics and Computer Engineering  
Advisor: Ahmet Bulut  
Thesis: *Conversion Rate Prediction in Search Engine Marketing*

**Sharif University of Technology**, Tehran, Iran Sept. 2007 - July 2012  
B.Sc. in Aerospace Engineering  
Advisor: Afshin Banazadeh  
Thesis: *Trajectory Planning for Multiple Unmanned Aerial Vehicles in Urban Environment*

## Research Experience

**Johns Hopkins University** **Research Assistant**  
Department of Computer Science, Baltimore, MD Sept. 2016 - May 2021

**Microsoft Research**  
Information and Data Sciences Group, Virtual

**Research Intern**  
June 2020 - Aug. 2020

**Center of Institutional Evaluation, Research and Planning**  
University of Texas at El Paso, TX

**Research Intern**  
June 2015 - Sept. 2015

**Data Science Lab**  
Istanbul Sehir University, Istanbul, Turkey

**Research Assistant**  
Feb. 2014 - Jan. 2015

## Publications

**Razieh Nabi\***,<sup>1</sup> Rohit Bhattacharya\*, and Ilya Shpitser, “Full Law Identification In Graphical Models Of Missing Data: Completeness Results,” In *Proceedings of the Thirty Seventh International Conference on Machine Learning (ICML)*, PMLR 119: 2352-2362, 2020.

**Razieh Nabi\***, Rohit Bhattacharya\*, Ilya Shpitser, and James Robins, “Identification In Missing Data Models Represented By Directed Acyclic Graphs,” In *Proceedings of the Thirty Fifth Conference on Uncertainty in Artificial Intelligence (UAI)*, AUAI Press, 2019.  
Recipient of the **Tom Ten Have award** at Atlantic Causal Inference Conference.

**Razieh Nabi**, Daniel Malinsky, and Ilya Shpitser, “Learning Optimal Fair Policies.” In *Proceedings of the Thirty Sixth International Conference on Machine Learning (ICML)*, PMLR 97: 4674-4682, 2019.

**Razieh Nabi**, Phyllis Kanki, and Ilya Shpitser, “Estimation of Personalized Effects Associated With Causal Pathways,” In *Proceedings of the Thirty Fourth Conference on Uncertainty in Artificial Intelligence (UAI)*, AUAI Press, 2018.

**Razieh Nabi** and Ilya Shpitser, “Fair Inference on Outcomes,” In *Proceedings of the Thirty Second Conference on Association for the Advancement of Artificial Intelligence (AAAI)*, AAAI Press, 2018.

**Razieh Nabi** and Xiaogang Su, “coxphMIC: An R Package for Sparse Estimation of Cox Proportional Hazards Models via Approximated Information Criteria,” *The R Journal*, 9(1): 229 - 238, 2017.

**Razieh Nabi** and Afshin Banazadeh, “3D Offline Path Planning for Surveillance Aerial Vehicles using B-splines,” *International Conference on Advanced Mechatronic Systems*, 2013.

*Preprints:*

**Razieh Nabi\***, Rohit Bhattacharya\*, and Ilya Shpitser, “Semiparametric Inference For Causal Effects In Graphical Models With Hidden Variables,” arXiv: 2003.12659.

**Razieh Nabi**, Todd McNutt, and Ilya Shpitser, “Semiparametric Causal Sufficient Dimension Reduction of High Dimensional Treatments,” arXiv: 1710.06727.

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<sup>1</sup>\* Indicates equal contribution.

**Razieh Nabi**, Daniel Malinsky, and Ilya Shpitser, “Optimal Training of Fair Predictive Models,” arXiv: 1910.04109.

Numair Sani, Jaron Lee, **Razieh Nabi**, and Ilya Shpitser, “A Semiparametric Approach to Interpretable Machine Learning,” arXiv: 2006.04732.

**Razieh Nabi**, Joel Pfeiffer, Murat Ali Bayir, Denis Charles, and Emre Kiciman, “Causal Inference In The Presence Of Interference In Sponsored Search Advertising,” arXiv: 2010.07458.

Daniel Scharfstein, **Razieh Nabi**, Edward Kennedy, Ming-Yueh Huang, Matteo Bonvini, and Marcela Smid, “Semiparametric Sensitivity Analysis: Unmeasured Confounding in Observational Studies,” arXiv: 2104.08300.

## Professional Activities

### Journal Reviewer

- Journal of the Royal Statistical Society (JRSS)
- Journal of the American Statistical Association (JASA)
- Journal of Machine Learning Research (JMLR)
- Journal of Statistical Software (JSS)
- Journal of Data Mining and Knowledge Discovery
- Journal of Experimental and Theoretical AI

### Conference Reviewer

- Conference on Machine Learning for Healthcare, MLHC 2020
- Conference on Neural Information Processing Systems, NeurIPS 2020
- Conference on Uncertainty in Artificial Intelligence, UAI 2020
- International Conference on Machine Learning, ICML 2020
- NeurIPS Reproducibility Challenge, 2019
- Conference on Neural Information Processing Systems, NeurIPS 2019
- International Conference on Machine Learning, ICML 2019
- International Conference on Artificial Intelligence and Statistics, AISTATS 2019
- Conference on Neural Information Processing Systems, NeurIPS 2018

### Session Chair

- Workshop on Advances in Causal Inference, 2020  
Held as part of the conference on Uncertainty in Artificial Intelligence (UAI)

### Program Committee Member

- Workshop on Causal Discovery and Causality-Inspired Machine Learning, 2020  
Held as part of the conference on Neural Information Processing Systems (NeurIPS)
- Workshop on Algorithmic Fairness through the Lens of Causality & Interpretability, 2020  
Appointed as reviewer for submissions to both the *Papers track* and *Breakout sessions*  
Held as part of the conference on Neural Information Processing Systems (NeurIPS)
- Workshop on Consequential Decision Making in Dynamic Environments, 2020  
Held as part of the conference on Neural Information Processing Systems (NeurIPS)
- Workshop on Algorithmic Bias in Search and Recommendation, 2020  
Held as part of the European Conference on Information Retrieval (ECIR)
- Workshop on Knowledge Discovery in Healthcare Data, 2016  
Held as part of the International Joint Conference on Artificial Intelligence (IJCAI)

## Teaching Experience

### Instructor

- Fairness in Data Science: Criteria, Algorithms and Open Problems (upcoming) 2022  
A day-long course on developed methodologies for “fairness-aware” algorithms  
To be held in *Statistics in Epidemiology* session at Joint Statistical Meetings (JSM)
- Should Susan Smoke: An Introduction to Causal Inference Intersession 2020  
A month-long course on the statistical and philosophical foundations of causality  
The course was co-instructed and featured at [Johns Hopkins Hub magazine](#)
- Pre-College Math, University of Texas at El Paso Summer 2015  
A summer-long course on basic calculus concepts, algebra, trigonometry, and geometry

### Head Course Assistant

- Machine Learning: Data to Models, Johns Hopkins University Spring 2019

### Teaching Assistant

- Causal Inference, Johns Hopkins University Fall 2018
- Probability and Statistics, University of Texas at El Paso Spring 2016
- Elementary Statistical Methods, University of Texas at El Paso Fall 2015
- Calculus I/II, University of Texas at El Paso Spring 2015
- Physics I/II and Laboratory, Istanbul Sehir University Sept. 2013 - Jan. 2015

## Invited Talks

- **UAI Workshop** on Advances in Causal Inference, virtual July 2021  
Title: *Semiparametric Inference For Causal Effects In Graphical Models With Hidden Variables*

(Plenary Talk)

**Online Causal Inference Seminar**, virtual May 2021  
Title: *Semiparametric Inference For Causal Effects In Graphical Models With Hidden Variables*  
(Plenary Talk)

**Helmholtz AI**, Munich, Germany April 2021  
Title: *Semiparametric Inference For Causal Effects In Graphical Models With Hidden Variables*

**European Consortium for Informatics and Mathematics** Dec 2020  
ERCIM Working Group on Computational and Methodological Statistics (CMStatistics)  
Title: *Semiparametric Inference For Causal Effects In Graphical Models With Hidden Variables*  
(Plenary Talk)

**Amazon Research**, Tuebingen, Germany Dec 2020  
Title: *Algorithmic Fairness via Causal Mediation Analysis*

**Cornell University**, NY, USA Oct 2020  
Title: *Semiparametric Inference For Causal Effects In Graphical Models With Hidden Variables*

**Microsoft Bing Ads and Microsoft Research**, WA, USA Aug 2020  
Title: *Causal Inference With Interference In Ad Placement*

**Microsoft Research**, AI and Society Seminar Series, WA, USA July 2020  
Title: *Learning Optimal Fair Policies*

**University College London**, London, UK July 2020  
Title: *Full Law Identification In Graphical Models Of Missing Data: Completeness Results*

**Netflix Inc**, CA, USA June 2020  
Title: *Full Law Identification In Graphical Models Of Missing Data: Completeness Results*

**University of Oxford and DeepMind**, AI Safety Teams, UK June 2020  
Title: *Learning Optimal Fair Policies*

**Ecole Polytechnique, INRIA Saclay, and Google Brain**, France May 2020  
Title: *Full Law Identification In Graphical Models Of Missing Data: Completeness Results*

**Bloomberg School of Public Health**, Johns Hopkins University, MD, USA April 2020  
Title: *Semiparametric Inference For Causal Effects In Graphical Models With Hidden Variables*

**Harvard University**, Kolokotronis Circle, MA, USA Oct 2019  
Title: *Learning Optimal Fair Policies*

**Reading Group at Institute for Quantitative Social Science**, USA Oct 2019  
Title: *Identification In Missing Data Models Represented By Directed Acyclic Graphs*

**International Conference on Machine Learning**, CA, USA June 2019

Title: *Learning Optimal Fair Policies*  
(Plenary Talk)

**Caltech**, Decisions, Games, and Logic Workshop, CA, USA June 2019  
Title: *Learning Optimal Fair Policies*  
(Plenary Talk)

**Grad Council Student Seminar**, Johns Hopkins University, MD, USA June 2019  
Title: *Learning Optimal Fair Policies*

**Guest lecturer at Causal Inference course**, Johns Hopkins University Dec 2018  
Title: *Fair Regressions and Fair Policies*

**Association for the Advancement of Artificial Intelligence**, LA, USA Jan 2018  
Title: *Fair Inference On Outcomes*  
(Plenary Talk)

**Join Meeting of Statistical Genetics and Causal Inference groups**, JHU Oct 2017  
Title: presenting work on *Automating Mendelian randomization through machine learning to construct a putative causal map of the human phenome*

**University of Washington**, Aerospace Engineering Department, WA, USA Feb 2015  
Title: *Dynamic Machine Learning and Big Data Analysis*

## Poster Presentations

**Workshop on Causal Discovery and Causality-Inspired ML**, NeurIPS 2020  
• Causal Inference in the Presence of Interference in Sponsored Search Advertising

**Statistical and Applied Mathematical Sciences Institute**, Duke University 2019  
• Identification in Missing Data Models Represented by Directed Acyclic Graphs, and  
• Estimation of Personalized Effects Associated with Causal Pathways

**International Conference on Machine Learning**, Long Beach, CA 2019  
• Learning Optimal Fair Policies

**Uncertainty in Artificial Intelligence**, Causal Inference Workshop, Monterey, CA 2018  
• Learning Optimal Fair Policies, and  
• Semiparametric Causal Sufficient Dimension Reduction of High Dimensional Treatment

**Atlantic Causal Inference Conference**, Pittsburgh, PA 2018  
• Estimation of Optimal Path-Specific Policies,  
• Fair Inference on Outcomes, and  
• Semiparametric Causal Sufficient Dimension Reduction of High Dimensional Treatment

- Computing Research Association**, Grad Cohort for Women, San Francisco, CA 2018
  - Fair Inference on Outcomes
- Neural Information Processing Systems**, Causal Inference Workshop, CA 2017
  - Fair Inference on Outcomes, and
  - Semiparametric Causal Sufficient Dimension Reduction of High Dimensional Treatment
- Computing Community Consortium Symposium**, Washington DC 2017
  - Fairness Through Causality

## Honors and Awards

- Reviewer Award, Conference on Neural Information Processing Systems, NeurIPS 2020  
Awarded to top 10% of high-scoring reviewers at NeurIPS
- Grace Hopper Celebration (GHC) Student Scholarship, 2020  
Organized by AnitaB.org for celebration of women in computing
- Travel Award, Statistical and Applied Mathematical Sciences Institute (SAMSI), Dec. 2019  
Causal Inference Program Opening Workshop, Duke University
- Thomas R. Ten Have award, ACIC, May 2019  
Awarded for best poster at the Atlantic Causal Inference Conference, Montreal, Canada
- Summer Institute Scholarship, University of Washington, June 2018  
Program: Summer Institute In Statistics and Modeling in Infectious Diseases (SISMID)
- Travel Award, Grad Cohort for Women, April 2018  
Awarded by Computing Research Association
- Travel Award, Computing Community Consortium, Oct. 2017
- Distinguished Bachelor Dissertation Award, Tehran, Iran, 2012

## Extracurricular

- STEM Pen Pal, [Letters to Young Pre-Scientists](#)
- Volunteer Translator, [Coursera Global Translator Community](#)
- Runner