AMANDA COSTON

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Education

2017-Now — CARNEGIE MELLON UNIVERSITY
Ph.D. candidate in Machine Learning and Public Policy
Advisors: Alexandra Chouldechova & Edward Kennedy
Thesis: "Principled machine learning for societally consequential decision making".
Committee: Edward Kennedy, Alexandra Chouldechova, Hoda Heidari, & Sendhil Mullainathan

2017-2019 — CARNEGIE MELLON UNIVERSITY
M.S. in Machine Learning.

2009-2013 — PRINCETON UNIVERSITY
B.S.E. *magna cum laude* in Computer Science
Certificate in the Princeton School of Public and International Affairs
Advisor: Robert Schapire
Thesis: "Machine learning techniques for the diagnosis of pediatric tuberculosis".

Selected Awards & Honors

Research

2022 Rising Star in EECS by UT-Austin
2022 Rising Star in Machine Learning by University of Maryland
2022 Rising Star in Data Science by University of Chicago
2022 Meta Research PhD Fellow
2022 Future Leader in Responsible Data Science by University of Michigan Institute for Data Science
2020 K&L Gates Presidential Fellow in Ethics and Computational Technologies
2019 NSF Graduate Research Fellow
2019 Tata Consultancy Services Presidential Fellow
2019 Suresh Konda Best First Paper Award by Heinz College of Carnegie Mellon University

Service

2020 Carolyn Comer Graduate Student Involvement Award by Carnegie Mellon University
2013 Department of Computer Science Service Award by Princeton University

Research & Industry Experience

2021 — FACEBOOK AI APPLIED RESEARCH (FAIAR)
Research intern, Responsible AI
Conducted a creator-centric fairness assessment of Instagram Reels.

2020 REGLAB, STANFORD UNIVERSITY
Research Fellow, Regulation, Evaluation, and Governance Lab at Stanford Law School
Conducted audit of mobility data for racial bias.

2018 IBM RESEARCH AI
Science for Social Good Fellow
Developed methods for fairness-aware learning under domain shift.

2017 HIVISASA
Technical Consultant, Kenya
Built full-stack analytics for citizen journalism website.

2015-2017 TENEO
Data Scientist

2013-2015 MICROSOFT
Program Manager, Bing

2010-2011 SHELTON PSYCHOLOGY LAB, PRINCETON UNIVERSITY
Research Assistant
Administered experiments testing stereotype priming effect on STEM performance

Research Interests

Theory: causal inference, machine learning, algorithmic fairness & societal impacts
Application: child welfare, consumer credit lending, criminal justice, health policy

Publications & Manuscripts

* *indicates joint lead authors*

Working Papers

Coston A, Kennedy EH. Counterfactual audit of racial bias in police traffic stops. *American Causal Inference Conference (ACIC) 2022* oral presentation (20% selection rate).

Coston A, Kennedy EH. The role of the geometric mean in case-control studies. arxiv.org:2207.09016

Rambachan A, Coston A, Kennedy EH. Counterfactual risk assessments under unmeasured confounding. *ACIC 2022*. *NeurIPS 2022 Workshop on Algorithmic Fairness through the Lens of Causality and Privacy.* arxiv.org:2212.09844

Field A, Coston A, Putnam-Hornstein E, Steier D, Chouldechova A, Tsvetkov Y. Using natural language processing for risk assessment in the child protection system. *Under review.*

Guerdan L, Coston A, Zhiwei SW, Holstein K. Ground(less) truth: The problem with proxy outcomes in human-AI decision making. *NeurIPS 2022 Workshop on Human-Centered AI.*

Guerdan L, Coston A, Zhiwei SW, Holstein K. Counterfactual decision support under treatment-conditional outcome measurement error. *NeurIPS 2022 Workshop on Causality for Real-world Impact.*

Publications

Coston A, Kawakami A, Zhu Y, Holstein K, Heidari H. A validity perspective on evaluating the justified use of data-driven decision-making algorithms. *IEEE Conference on Secure and Trustworthy Machine Learning (forthcoming)*. 2023. (arxiv.org:2206.14983)

Coston A*, Rambachan A*, Chouldechova A. Characterizing fairness over the set of good models under selective labels. *International Conference on Machine Learning 139 (ICML)*. 2021; 2144-2155. http://proceedings.mlr.press/... (arxiv.org:2101.00352)

Coston A, Guha N, Ouyang D, Lu L, Chouldechova A, Ho DE. Leveraging administrative data for bias audits: Assessing disparate coverage with mobility data for COVID-19 policy. *Proceedings of the ACM Conference on Fairness, Accountability, and Transparency (FAccT)*. 2021; 173-184. doi:10.1145/3442188.3445881 (arxiv.org:2011.07194)

Coston A, Kennedy EH, Chouldechova A. Counterfactual predictions under runtime confounding. *Advances in Neural Information Processing Systems 33 (NeurIPS)*. 2020; 4150-4162. https://papers.nips.cc/paper/... (arxiv.org:2006.16916)

Coston A, Mishler A, Kennedy EH, Chouldechova A. Counterfactual risk assessments, evaluation, and fairness. *Proceedings of the ACM Conference on Fairness, Accountability, and Transparency (FAccT)*. 2020; 582-593. doi:10.1145/3351095.3372851 (arxiv.org:1909.00066)

Zhao H, Coston A, Adel T, Gordon GJ. Conditional learning of fair representations. *International Conference on Learning Representations (ICLR)*. 2020. https://iclr.cc/... (arxiv.org:1910.07162)

Li L, Zuo R, Coston A, Weiss JC, Chen GH. Neural topic models with survival supervision: Jointly predicting time-to-event outcomes and learning how clinical features relate. *International Conference on Artificial Intelligence in Medicine (AIME)*. 2020; 371-381. https://link.springer.com/... (arxiv.org:2007.07796)

Coston A, Ramamurthy KN, Wei D, Varshney KR, Speakman S, Mustahsan Z, Chakraborty S. Fair transfer learning with missing protected attributes. *Proceedings of the AAAI / ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*. 2019; 91-98. doi:10.1145/3306618.3314236

Book Chapter

Coston A, Rubio MD, Kennedy EH. Statistical analysis of randomized experiments. *AI for Social Impact* (forthcoming).

Peer-reviewed non-archival papers

Rambachan A, Coston A, Kennedy EH. Counterfactual risk assessments under unmeasured confounding. *ACIC 2022*. *NeurIPS 2022 Workshop on Algorithmic Fairness through the Lens of Causality and Privacy.* arxiv.org:2212.09844

Guerdan L, Coston A, Zhiwei SW, Holstein K. Counterfactual decision support under treatment-conditional outcome measurement error. *NeurIPS 2022 Workshop on Causality for Real-world Impact.*

Guerdan L, Coston A, Zhiwei SW, Holstein K. Ground(less) truth: The problem with proxy outcomes in human-AI decision making. *NeurIPS 2022 Workshop on Human-Centered AI.*

Coston A, Kennedy EH. Counterfactual audit of racial bias in police traffic stops. *ACIC 2022* oral presentation (20% selection rate).

Coston A, Kawakami A, Zhu Y, Holstein K, Heidari H. A validity perspective on evaluating the justified use of data-driven decision-making algorithms. *ACM conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO 2022)*. arxiv.org:2206.14983

Coston A, Kennedy EH, Chouldechova A. Counterfactual risk assessments, evaluation, and fairness. *NeurIPS 2019 Workshop on Causal Machine Learning.*

Coston A, Kennedy EH, Chouldechova A. Counterfactual risk assessments and evaluation for child welfare screening. *ACIC 2019*.

Coston A, Leqi L. Offline heterogeneous policy evaluation: A causal approach. *ICML 2018 Workshop on Causal ML.*

Presentations

Invited Talks

2022	Symposium on Frontiers of Machine Learning & AI, University of Southern California, LA, CA
2022	INFORMS Session on Finding Sets of Near-Optimal Solutions for Mixed-Integer Programs, Indianapolis, IN
2022	American Mathematical Society Sectional Meeting on Causality, Amherst, MA *(declined)*
2022	Brown University Bravo Center Workshop on the Economics of Algorithms, Providence, RI
2022	Stanford University RegLab Summer Institute Speaker Series, Virtual
2021	Merck Data Science All Hands, Virtual
2021	Johns Hopkins University Causal Inference Working Group, Virtual
2021	PlaceKey COVID-19 Data Consortium, Virtual
2021	University of Pennsylvania Department of Biostatistics and Epidemiology, Virtual
2020	University of Chicago Crime Lab, Virtual

Doctoral Consortia

2022	EAAMO (ACM conference on Equity & Access in Algorithms, Mechanisms, and Optimization)
2022	FAccT (ACM Conference on Fairness, Accountability, and Transparency)
2020	FAccT (ACM Conference on Fairness, Accountability, and Transparency)
2019	AIES (AAAI / ACM Conference on Artificial Intelligence, Ethics, and Society)

Patents

2022	Enhancing Fairness in Transfer Learning for Machine Learning Models with Missing Protected Attributes in Source or Target Domains. Supriyo Chakraborty, Amanda Coston, Zairah Mustahsan, Karthikeyan Natesan Ramamurthy, Skyler Speakman, Kush R. Varshney, and Dennis Wei. US 11,443,236. *Granted.*

Service

Organization

2019-Now	Steering Committee of Machine Learning for Developing World (ML4D) NeurIPS Workshop
2019-2020	Co-organizer of Fairness, Ethics, Accountability, and Transparency Reading Group at CMU
2019-2020	Co-organizer of Machine Learning Department (MLD) Tea at CMU
2018-2019	Co-organizer of ML4D NeurIPS Workshop

Journal Referee

Nature Human Behaviour
Journal of the Royal Statistical Society (JRSS-B)
Journal of the American Statistical Association (JASA)
Data Mining and Knowledge Discovery

Program Committee and Conference Reviewer

2023	Reviewer, ICLR
2022	Ethical Reviewer, NeurIPS
2022	Reviewer, NeurIPS
2022	Reviewer, NeurIPS Datasets and Benchmarkts
2022	Program Committee, EAAMO
2022	Program Committee, FAccT
2022	Reviewer, ICML
2022	Reviewer, ICLR
2021	Area Chair, Responsible AI workshop at ICLR
2021	Ethical Reviewer, NeurIPS
2021	Reviewer, NeurIPS
2021	Reviewer, NeurIPS Datasets and Benchmarkts
2021	Program Committee, FAccT
2021	Reviewer, ICML
2020	Reviewer, NeurIPS
2020	Program Committee, FAccT
2020	Reviewer, ICML
2020	Program Committee, AIES
2020	Program Committee, AAAI Emerging Track on AI for Social Impact
2019	Program Committee, IJCAI Workshop on AI for Social Good

Leadership

2012-2013	Committee on Discipline, Princeton University
2012-2013	Computer Science Undergraduate Council, Princeton University

Invited Conference & Workshop Roles

2022	Roundtable Lead for NeurIPS Workshop on Algorithmic Fairness through Lens of Causality
2022	Breakout Group Moderator for CCC & INFORMS Workshop II on AI/OR
2022	Breakout Group Moderator for NSF-Amazon Fairness in AI Principal Investigator meeting
2022	Session Chair for Responsible Data Management Session at FAccT

Teaching Experience

Teaching Assistant

2021 Spring	Introduction to Machine Learning (10-301/10-601), CARNEGIE MELLON UNIVERSITY
2012 Fall	Computers in our World (COS 109), PRINCETON UNIVERSITY

Project Instructor

2019 Summer	AI4ALL, CARNEGIE MELLON UNIVERSITY ▷ Developed and led a project on algorithms, criminal justice, & fairness for high schoolers from historically excluded communities.

Mentorship

2022-Now	Women@SCS Mentor
2019-Now	CMU AI Mentor
2019	Women@SCS Roundtable Leader
2016-2017	Read Ahead Mentor
2014-2015	MySkills4Afrika (Microsoft) Virtual Mentor

Hackathon Distinctions

2015	Microsoft OneWeek Hackathon, Bing Finalist ▷ Web answer to enable victims of revenge porn to remove content from Bing and OneDrive
2013	NYU-Abu Dhabi Hackathon for the Social Good, 2nd Place ▷ Android app for sharing a travel route to facilitate safe travel for women
2012	Tiger Launch, Social Entrepreneurship, 3rd Place ▷ Web service using QR codes to empower consumers to support value-aligned businesses

Civic Engagement

2014-2015	Court Appointed Special Advocate, Family Law CASA ▷ Represented the child's interest in family law cases
2010-2012	Engineers Without Borders ▷ Obtained & configured 50 One Laptop Per Child netbooks for a library in Ashaiman, Ghana
2007-2008	Congressional Intern, U.S. House of Representatives ▷ Office of Congressman John Spratt representing South Carolina's 5th congressional district

Media Coverage

2021	"Smartphone Location Data Can Leave Out Those Most Hit by Covid-19." *Wall Street Journal*. https://www.wsj.com/articles/...
2020	"Stanford and Carnegie Mellon find race and age bias in mobility data that drives COVID-19 policy." *VentureBeat*. https://venturebeat.com/ai/...