Madison Coots

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Education

Harvard Kennedy School
Ph.D. Public Policy, 2022–2027 (expected)

Harvard University
M.A. Public Policy, 2022–2025

Stanford University
M.S. Computer Science (Artificial Intelligence), 2019–2021

Stanford University
B.S. Management Science and Engineering (Minor: English), 2015–2019

Research Interests

Algorithmic decision-making, responsible AI, data science, computational social science

Job Market Paper

Algorithmic Bias in Lending: Evidence from a Fintech Audit Preprint
Madison Coots, Robert Bartlett, Julian Nyarko, and Sharad Goel
Under review

Algorithmic lending has transformed the consumer credit landscape, with machine learning models commonly facilitating underwriting decisions. To comply with fair lending laws, these algorithms exclude legally protected characteristics, such as race and gender. Yet algorithmic underwriting can still inadvertently favor certain groups, prompting concerns about whether lending algorithms exhibit discriminatory behavior. Using proprietary loan-level data from a major U.S. fintech platform, we audit lending decisions across approximately 80,000 personal loans. We find that loans made to men and Black borrowers yielded lower profits than loans to other groups, suggesting that men and Black borrowers benefited from relatively favorable pricing. We trace these disparities to miscalibration in the platform's underwriting model, which overestimates risk for women and underestimates risk for Black borrowers. We then show that one could correct this miscalibration—and the corresponding disparities—by including race and gender in underwriting models, illustrating a tension between competing notions of fairness.

Peer-Reviewed Publications

1. Alex Chohlas-Wood, **Madison Coots**, Joe Nudell, Julian Nyarko, Emma Brunskill, Todd Rogers, and Sharad Goel. "Automated Court Date Reminders Reduce Warrants for Arrest: Evidence from a Text Messaging Experiment." *Science Advances* (2025). Paper
2. **Madison Coots**, Kristin A. Linn, Sharad Goel, Amol S. Navathe, and Ravi B. Parikh. "Racial Bias in Clinical and Population Health Algorithms: A Critical Review of Current Debates." *Annual Review of Public Health* (2025). Paper
3. **Madison Coots**, Soroush Saghafian, David Kent, and Sharad Goel. "A Framework for Considering the Role of Race and Ethnicity in Estimating Disease Risk." *Annals of Internal Medicine* (2024). Paper
4. Alex Chohlas-Wood, **Madison Coots**, Henry Zhu, Sharad Goel, and Emma Brunskill. "Learning to be Fair: A Consequentialist Approach to Equitable Decision-Making." *Management Science* (2024). Paper
5. Alex Chohlas-Wood*, **Madison Coots***, Sharad Goel*, and Julian Nyarko*. "Designing Equitable Algorithms." *Nature Computational Science*, Vol. 3 (2023). Paper *Authors contributed equally.

Book Chapters

6. **Madison Coots**, Kristin A. Linn, Sharad Goel, Amol S. Navathe, and Ravi B. Parikh. "Racial Bias in Clinical and Population Health Algorithms: A Critical Review of Current Debates." Chapter in *Social Stratification*, 5th Edition, edited by Michelle Jackson, Nima Dahir, Claire Daviss, and David B. Grusky. Routledge (2027).

Research in Progress

7. **Madison Coots**, Hans Gaebler, Josh Grossman, Alex Chohlas-Wood, Julian Nyarko, Ravi Shroff, and Sharad Goel. "Towards Individualized Risk Predictions with LLMs." In preparation (2026).
8. **Madison Coots**, Calvin Isley, Elisa Xi Chen, Nick Masi, Joe Nudell, Charlotte Tuminelli, Teddy Svoronos, and Sharad Goel. "AI Tutoring and Teacher Support Tools for Elementary Education." In preparation (2026).

Honors and Awards

Rising Star in Data Science *Univ. of Chicago, Harvard, Stanford, & UC San Diego* . 2026

Distinction in Student Teaching Award *Harvard Kennedy School* 2026

Dissertation Research Grant ($10,000) *Horowitz Foundation for Social Policy* 2026

Rising Star in IOE-ISyE-MS&E *Univ. of Michigan, Georgia Tech, & Stanford* 2026

Dean's Award for Excellence in Student Teaching *Harvard Kennedy School* 2025

Distinction in Student Teaching Award *Harvard Kennedy School* 2025

Social Equity and Health Equity Grant ($5,000) *Malcolm Wiener Center, Harvard Kennedy School* 2025

James M. and Cathleen D. Stone PhD Scholar *Harvard University* 2023–present

Harvard Graduate Prize Fellowship *Harvard University* 2022–2023

Stanford Engineering Coterminal Fellowship *Stanford University* 2019–2020

Stokes Scholar *U.S. Federal Government* 2017–2021

Invited Talks

Harvard Applied Statistics Workshop 2026
Harvard Kennedy School Data + Donuts Series 2026
IOE-ISyE-MS&E Rising Stars Workshop (Univ. of Michigan) 2026
Predictive Analytics & Comparative Effectiveness Center Symposium (Tufts Univ.) . 2024
Guest Lecture in MS&E 298: Detecting Discrimination with Data (Stanford Univ.) . 2023
Internet Institute Speaker Series (Oxford Univ.) 2021

Conference Presentations

2026: APPAM Fall Research Conference (forthcoming; contributed); INFORMS Annual Meeting (contributed); Conference on Empirical Legal Studies (contributed); International Conference on Computational Social Science (contributed); Econometric Society ESIF Economics and AI+ML Conference (contributed); POMS Annual Conference (contributed)

2025: American Law and Economics Association Conference (contributed); POMS Annual Conference (invited)

2024: Society for Medical Decision Making Annual Meeting (contributed); International Conference on Computational Social Science (contributed)

2023: Computational and Methodological Statistics Conference (invited); APPAM Fall Research Conference (contributed); INFORMS Annual Meeting (invited); INFORMS Healthcare Conference (invited)

2022: ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (contributed)

Teaching

API 201: Quantitative Analysis and Empirical Methods I
Teaching Fellow, Harvard Kennedy School, Fall 2024, 2025
Applied statistics course in the MPP core: exploring and summarizing data with R, probability theory, statistical inference, and decision analysis

API 202Z: Quantitative Analysis and Empirical Methods II
Teaching Fellow, Harvard Kennedy School, Spring 2025, 2026
Advanced applied statistics course in the MPP core: statistical inference and linear regression models

API 203Z: Quantitative Analysis and Empirical Methods III
Teaching Fellow, Harvard Kennedy School, Spring 2025
Advanced applied statistics course in the MPP core: causal inference and machine learning

DPI 681M: The Science and Implications of Generative AI
Teaching Fellow, Harvard Kennedy School, Spring 2024
Designed and taught the technical complement on language models, deep learning models, and transformers

MS&E 125: Applied Statistics
Course Assistant, Stanford University, School of Engineering, Winter 2020
Undergraduate course in applied statistics: exploring and summarizing data, statistical inference, linear and logistic regression

MS&E 252: Foundations of Decision Analysis
Course Assistant, Stanford University, School of Engineering, Fall 2019
Graduate course in quantitative decision analysis covering utility theory, sensitivity analysis, and value of information

Code in Place
Volunteer Section Leader, Stanford University, Spring 2020
A 5-week introductory Python course offered during COVID-19 with 10,000 global students and 900 volunteer teachers; prepared and taught a weekly discussion section of 10–12 students

Professional Experience

Systems & Technology Research
Senior Data Scientist (Part-time), Woburn, MA, 2023–present

Stanford Computational Policy Lab
Data Scientist, Stanford, CA, 2020–2022

Aerospace Technical Services
Data Scientist (Part-time), Remote, 2020–2024

U.S. Government (agency withheld)
Data Science Intern, Washington, D.C., 2017–2021

Academic Service

Refereeing

Epidemiology 2025

International Conference on Computational Social Science 2025, 2026

Leadership

Session Chair, Generative AI and Societal Sustainable Operations Track
Production and Operations Management Society (POMS) Conference 2027

Organizing Team Member, Teaching Statistics in the Age of Agentic AI Workshop
Harvard Kennedy School 2026

Supporting Instructor, An Introduction to Reproducible Programming and Project Management Short Course *Society of Medical Decision Making Annual Meeting* 2024

Skills

Languages: R, Python

AI: LLM evaluation, text data processing, chatbot design and user experience for AI systems, agentic workflows

Methods: Statistical inference, causal inference, simulation, decision analysis

Additional Information

Hobbies & Interests
Plant cultivation and collection (specializing in Hoya species), bird watching, baking

Citizenship
United States, Mexico