Madison Coots

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Education

- **Harvard Kennedy School of Government** — Cambridge, MA
  Doctor of Philosophy - Public Policy — *August 2022 - Present*
  Track: *Judgment and Decision Making*
- **Stanford University** — Stanford, CA
  Master of Science - Computer Science — *September 2019 - June 2021*
  Specialization: *Artificial Intelligence*
- **Stanford University** — Stanford, CA
  Bachelor of Science - Management Science and Engineering — *September 2015 - June 2019*
  Minor: *English*

Honors and Awards

- James M. and Cathleen D. Stone PhD Scholar in Inequality and Wealth Concentration, Stone Program in Wealth Distribution, Inequality, and Social Policy, Harvard University - 2023-2024
- Harvard Graduate Prize Fellowship - 2022-2023
- Stanford Engineering Coterminal Fellowship - 2019-2020
- U.S. Government Graduate Scholar - 2019-2021
- U.S. Government Undergraduate Scholar - 2017-2019

Publications

[1] **Racial Bias in Clinical and Population Health Algorithms: A Critical Review of Current Debates. Madison Coots**, Kristin A. Linn, Sharad Goel, Amol S. Navathe, and Ravi B. Parikh. *Annual Review of Public Health (forthcoming).* 2025.

[2] **A Framework for Considering the Role of Race and Ethnicity in Estimating Disease Risk. Madison Coots**, Soroush Saghafian, David Kent, and Sharad Goel. *Annals of Internal Medicine.* 2024.

[3] **Learning to be Fair: A Consequentialist Approach to Equitable Decision-Making.** Alex Chohlas-Wood, **Madison Coots**, Henry Zhu, Sharad Goel, and Emma Brunskill. *Management Science.* 2024.

[4] **Designing Equitable Algorithms.** Alex Chohlas-Wood, **Madison Coots**, Julian Nyarko, and Sharad Goel. *Nature Computational Science, Vol. 3. 2023.*

[5] **Automated Court Date Reminders Reduce Warrants for Arrest: Evidence from a Text Messaging Experiment.** Alex Chohlas-Wood, **Madison Coots**, Joe Nudell, Julian Nyarko, Emma Brunskill, Todd Rogers, and Sharad Goel. *Working paper.* 2023.

[6] **Constrained Multi-objective Optimization with Contextual Multi-Armed Bandits.** Henry Zhu, Alex Chohlas-Wood, **Madison Coots**, Sharad Goel, and Emma Brunskill. *Working paper.* 2022.

[7] **Generative Grading: Near Human-level Accuracy for Automated Feedback on Richly Structured Problems.** Ali Malik, Mike Wu, Vrinda Vasavada, Jinpeng Song, **Madison Coots**, John Mitchell, Noah Goodman, Chris Piech. *Proceedings of the 14th International Conference on Educational Data Mining, Paris, France.* 2021.

Conference Presentations and Invited Talks

- **Predictive Analytics & Comparitive Effectiveness Center Symposium:** Invited talk on "A Framework for Considering the Role of Race and Ethnicity in Estimating Disease Risk." 2024.
- **Society of Medical Decision Making 46th Annual Meeting:** Oral presentation on "A Framework for Considering the Role of Race and Ethnicity in Estimating Disease Risk." 2024.
- **International Conference on Computational Social Science:** Poster presentation on "Reevaluating the Role of Race and Ethnicity in Estimating Disease Risk." 2024.
- **Computational and Methodological Statistics Conference:** Oral presentation on "Reevaluating the Role of Race and Ethnicity in Estimating Disease Risk." 2023.
- **APPAM Conference:** Oral presentation on "Automated Court Date Reminders Reduce Warrants for Arrest: Evidence from a Text Messaging Experiment." 2023.
- **INFORMS General Meeting:** Oral presentation on "Reevaluating the Role of Race and Ethnicity in Diabetes Screening." 2023.

- **INFORMS Healthcare Conference:** Oral presentation on "Reevaluating the Role of Race and Ethnicity in Diabetes Screening." 2023.
- **ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization:** Oral presentation, given jointly with Alex Chohlas-Wood. 2022.
- **American Causal Inference Conference:** Poster presentation. 2022.
- **Oxford University, Internet Institute Speaker Series:** Presentation on computational approaches to equitable decision-making, given jointly with Alex Chohlas-Wood. 2021.

Teaching

- **API 201: Quantitative Analysis and Empirical Methods I (Fall 2024); Teaching Fellow.** Graduate course in applied statistics: exploring and summarizing data with R, probability theory, decision analysis.
- **DPI 681M: The Science and Implications of Generative AI (Spring 2024); Teaching Fellow.** Designed and taught the technical compliment to the course on language models, deep learning models, and transformers.
- **MS&E 252: Foundations of Decision Analysis (Fall 2019); Course Assistant.** Graduate course in quantitative decision analysis covering: utility theory, decision framing, sensitivity analysis, value of information, assessing and using decision maker risk attitude. *Recognized by Stanford Center for Professional Development for excellence in teaching.*
- **MS&E 125: Applied Statistics (Winter 2020); Course Assistant.** Undergraduate course in applied statistics: exploring and summarizing data, methods for statistical inference, linear and logistic regression models.
- **Stanford Code in Place (Spring 2020); Section Leader.** Part of a teaching team for Code in Place, offered by Stanford during COVID-19 pandemic, with 10,000 global students and 900 volunteer teachers participating from around the world. Prepared and taught a weekly discussion section of 10-12 students to supplement professors' lectures in a 5-week introductory online Python programming course.

Professional Experience

- **Systems & Technology Research** — Woburn, MA
  Senior Data Scientist (Part-time) — *February 2023 - Present*
- **Stanford Computational Policy Lab** — Stanford, CA
  Data Scientist — *September 2020 - August 2022*
- **Aerospace Technical Services** — Remote
  Data Science Consultant — *September 2020 - June 2024*
- **U.S. Federal Government (Agency name witheld)** — Washington D.C.
  Data Science Fellow — *June 2017 - January 2021*

Skills Summary

- **Languages.** Python, R, SQL, Julia, JavaScript, HTML, CSS
- **Skills.** Machine Learning, Stochastic Modeling, Linear Optimization, Probabilistic Analysis, Decision and Risk Analysis, Data Visualization, Web Development