

Emily Diana

Office 5000 Forbes Ave
Pittsburgh, PA
15213

Phone +1 (860) 389 7309
Email ediana@andrew.cmu.edu
Website www.emilyruthdiana.com

Last updated March 2025

Research Interests

Ethical algorithm design, fairness and privacy in machine learning, strategic classification, statistical learning, proxy attributes

Academic Appointment

Aug 2024 - Tepper School of Business
Assistant Professor of Operations Research

Sept 2023 - Toyota Technological Institute at Chicago
Jul 2024 *Research Assistant Professor*

Education

2018-2023 Ph.D. in Statistics and Data Science - The Wharton School, University of Pennsylvania
Advisors: Michael Kearns and Aaron Roth
Committee: Michael Kearns, Aaron Roth, Shane Jensen, Edgar Dobriban
Thesis: *Approaches Addressing Algorithmic Bias and Disclosiveness*

2017-2018 M.S. in Statistics - Stanford University

2011-2015 B.A. in Applied Mathematics, cum laude - Yale College
Thesis: *Maintaining Bipartite Structure with a Modified Louvain Algorithm*
Supervisor: Daniel Spielman

Awards

FORC Best Paper (2024)

The Wharton School's J. Parker Memorial Bursk Prize for Excellence in Research (2022)

Michigan Institute for Data Science Future Leader (2022)

MIT EECS Rising Star (2021)

Brown Best Student Paper Award (2021)

Wellcome Data Re-Use Prize: Malaria (£15000, 2019)

Weapons Simulation and Computing Code Development Silver Star Award (2017)

Pre-Prints

1. Tina Behzad, Silvia Casacuberta, **Emily Diana**, and Alexander Williams Tolbert. Reconciling predictive multiplicity in practice, 2025.
2. **Emily Diana** and Alexander Williams Tolbert. Correcting underrepresentation and intersectional bias for fair classification, 2025.
3. Pushkar Shukla, Aditya Chinchure, **Emily Diana**, Alexander Tolbert, Kartik Hosanagar, Vineeth N. Balasubramanian, Leonid Sigal, and Matthew A. Turk. Biasconnect: Investigating bias interactions in text-to-image models, 2025.
4. Avrim Blum, **Emily Diana**, Kavya Ravichandran, and Alexander Williams Tolbert. A theoretical model for grit in pursuing ambitious ends, 2025.

Peer-Reviewed Publications

1. **Emily Diana**, Zhengyang Shan, and Jiawei Zhou. Gender inclusivity fairness index (gifi): A multilevel framework for evaluating gender diversity in large language models. In *The 63rd Annual Meeting of the Association for Computational Linguistics (to appear)*, 2025
2. **Emily Diana**, Saeed Sharifi-Malvajerdi, and Ali Vakilian. Minimax group fairness in strategic classification. In *3rd IEEE Conference on Secure and Trustworthy Machine Learning (to appear)*, 2025
3. **Emily Diana**, Alexander Williams Tolbert, Kavya Ravichandran, and Avrim Blum. Adaptive algorithmic interventions for escaping pessimism traps in dynamic sequential decisions. In *6th Symposium on Foundations of Responsible Computing (to appear)*, 2025.
4. Siqi Deng, **Emily Diana**, Michael Kearns, and Aaron Roth. Balanced Filtering via Disclosure-Controlled Proxies. In Guy N. Rothblum, editor, *5th Symposium on Foundations of Responsible Computing (FORC 2024)*, volume 295 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 4:1–4:23, Dagstuhl, Germany, 2024. Schloss Dagstuhl – Leibniz-Zentrum für Informatik.
5. **Emily Diana**, Wesley Gill, Michael Kearns, Krishnaram Kenthapadi, Aaron Roth, and Saeed Sharifi-Malvajerdi. Multiaccurate proxies for downstream fairness. In *2022 ACM Conference on Fairness, Accountability, and Transparency, FAccT '22*, page 1207–1239, New York, NY, USA, 2022. Association for Computing Machinery.
6. **Emily Diana**, Wesley Gill, Ira Globus-Harris, Michael Kearns, Aaron Roth, and Saeed Sharifi-Malvajerdi. Lexicographically Fair Learning: Algorithms and Generalization. In *2nd Symposium on Foundations of Responsible Computing (FORC 2021)*, volume 192 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 6:1–6:23, Dagstuhl, Germany, 2021. Schloss Dagstuhl – Leibniz-Zentrum für Informatik.
7. **Emily Diana**, Wesley Gill, Michael Kearns, Krishnaram Kenthapadi, and Aaron Roth. Minimax group fairness: Algorithms and experiments. In *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society, AIES '21*, page 66–76, New York, NY, USA, 2021. Association for Computing Machinery.
8. **Emily Diana**, Travis Dick, Hadi Elzayn, Michael Kearns, Aaron Roth, Zachary Schutzman, Saeed Sharifi-Malvajerdi, and Juba Ziani. Algorithms and learning for fair portfolio design. In *Proceedings of the 22nd ACM Conference on Economics and Computation, EC '21*, page 371–389, New York, NY, USA, 2021. Association for Computing Machinery.
9. **Emily Diana**, Hadi Elzayn, Michael Kearns, Aaron Roth, Saeed Sharifi-Malvajerdi, and Juba Ziani. Differentially private call auctions and market impact. In *Proceedings of the 21st ACM Conference on Economics and Computation, EC '20*, page 541–583, New York, NY, USA, 2020. Association for Computing Machinery.
10. **Emily Diana**, Michael Kearns, Seth Neel, and Aaron Roth. Optimal, truthful, and private securities lending. In *Proceedings of the First ACM International Conference on AI in Finance, ICAIF '20*, New York, NY, USA, 2020. Association for Computing Machinery.

Contributed Articles

1. **Emily Diana**, Mingzi Niu, and Georgy Noarov. Sigecom winter meeting 2022 highlights. *ACM SIGecom Exchanges*, 20(1):3–23, July 2022.

2. Charles R. Noble, Andrew T. Anderson, Nathan R. Barton, Jamie A. Bramwell, Arlie Capps, Michael H. Chang, Jin J. Chou, David M. Dawson, **Emily Diana**, Timothy A. Dunn, Douglas R. Faux, Aaron C. Fisher, Patrick T. Greene, Ines Heinz, Yuliya Kanarska, Saad A. Khairallah, Benjamin T. Liu, Jon D. Margraf, Albert L. Nichols, Robert N. Nourgaliev, Michael A. Puso, James F. Reus, Peter B. Robinson, Alek I. Shestakov, Jerome M. Solberg, Daniel Taller, Paul H. Tsuji, Christopher A. White, and Jeremy L. White. Ale3d: An arbitrary lagrangian-eulerian multi-physics code. Technical Report <https://www.osti.gov/biblio/1361589LLNL-TR-732040>, Lawrence Livermore National Lab. (LLNL), Livermore, CA (United States), May 2017.

Work Experience

Jun 2021 - Amazon Web Services (Remote)

April 2022 *Applied Scientist Intern*

Supervisors: Michele Donini and Bilal Zafar

Research Topic: Bias Mitigation Benchmarking for Amazon SageMaker Clarify (Working Paper)

Language: Python

Jun 2020 - Amazon Web Services (Remote)

May 2021 *Applied Scientist Intern*

Supervisors: Michael Kearns, Krishnaram Kenthapadi, Aaron Roth

Research Topics: Minimax Group Fairness, Multiaccurate Proxies for Downstream Fairness.

Mar 2018 - Center on Poverty and Inequality, Stanford University, Stanford, CA

Aug 2018 *Research Assistant*

Supervisors: David Grusky and Adrian Raftery

Research Topic: Developing methodologies to analyze trends in contemporary social mobility based on contingency tables of longitudinally-linked Census data.

Aug 2015- Lawrence Livermore National Laboratory, Livermore, CA

Sep 2017 *Scientific Software Developer*

Parallelized and integrated a domain decomposer, Recursive Inertial Bisection, into the mesh generation step of ALE3D, a multi-physics "Arbitrary Lagrangian-Eulerian 3D" numerical simulation code. Primary developer for LLNL's ParticlePack code. Member of team integrating a GPU portability abstraction into ALE3D's advection package. Presented research internally on implications of strided memory access patterns on GPU-accelerated computing.

Talks and Presentations

1. *Dagstuhl Seminar on Scheduling & Fairness*. "Minimax Group Fairness in Strategic Classification." 2025.
2. *Emory University*. "Correcting underrepresentation and intersectional bias for fair classification." 2024.
3. *University of Pittsburgh*. "Adaptive algorithmic interventions for escaping pessimism traps in dynamic sequential decisions." 2024.
4. *Toyota Technological Institute at Chicago*. "Balanced Filtering via Non-Disclosive Proxies." 2023.
5. *University of Wisconsin-Madison*. "Balanced Filtering via Non-Disclosive Proxies." 2023.
6. *YinzOR 2023 at Carnegie Mellon University*. "Balanced Filtering via Non-Disclosive Proxies." 2023.
7. *The Wharton School of the University of Pennsylvania*. "Approaches Addressing Algorithmic Bias and Disclosiveness." 2023. (Thesis Defense)
8. *University of Illinois Urbana-Champaign*. "Addressing Algorithmic Bias and Disclosiveness: Minimax Group Fairness and Multiaccurate Proxies." 2023. (Seminar)

9. *University of Chicago*. “Addressing Algorithmic Bias and Dislosiveness: Minimax Group Fairness and Multiaccurate Proxies.” 2023. (Seminar)
10. *Baruch College*. “Addressing Algorithmic Bias and Dislosiveness: Multiaccurate Proxies for Downstream Fairness.” 2023. (Seminar)
11. *University of Washington*. “Addressing Algorithmic Bias and Dislosiveness: Minimax Group Fairness and Multiaccurate Proxies.” 2023. (Seminar)
12. *University of Virginia*. “Addressing Algorithmic Bias and Dislosiveness: Minimax Group Fairness and Multiaccurate Proxies.” 2023. (Seminar)
13. *University of Florida*. “Addressing Algorithmic Bias and Dislosiveness: Minimax Group Fairness and Multiaccurate Proxies.” 2023. (Seminar)
14. *University of California, Irvine*. “Addressing Algorithmic Bias and Dislosiveness: Minimax Group Fairness and Multiaccurate Proxies for Redacted Features.” 2022. (Seminar)
15. *Gies College*. “Addressing Algorithmic Bias and Dislosiveness: Minimax Group Fairness and Multiaccurate Proxies for Redacted Features.” 2022. (Seminar)
16. *University of Michigan*. “Addressing Algorithmic Bias and Dislosiveness: Minimax Group Fairness and Multiaccurate Proxies for Redacted Features.” 2022. (Seminar)
17. *University of South Carolina*. “Addressing Algorithmic Bias and Dislosiveness: Minimax Group Fairness and Multiaccurate Proxies for Redacted Features.” 2022. (Seminar)
18. *Foster School of Business*. “Addressing Algorithmic Bias and Dislosiveness: Multiaccurate Proxies for Downstream Fairness.” 2022. (Seminar)
19. *Tippie College of Business*. “Addressing Algorithmic Bias and Dislosiveness: Multiaccurate Proxies for Downstream Fairness.” 2022. (Seminar)
20. *Michigan AI Symposium*. “Balanced Filtering via Non-Disclosive Proxies.” 2022. (Lightning Talk)
21. *IPAM Summer School on Algorithmic Fairness 2022*. “Multiaccurate Proxies for Downstream Fairness.” 2022. (Poster)
22. *ACM FAccT Conference 2022*. “Multiaccurate Proxies for Downstream Fairness.” 2022. (Short Talk, Long Talk, Poster)
23. *Lawrence Livermore National Laboratory Applied Statistics Group Seminar*. “Approaches Assessing Automated Bias: Minimax Fairness and Bias-Aware Proxies for Redacted Features.” 2022. (Invited Seminar)
24. *3rd Symposium on Foundations of Responsible Computing (FORC 2022)*. “Multiaccurate Proxies for Downstream Fairness.” 2022. (Talk)
25. *Wharton Statistics PhD Student Seminar Day*. “Bias Mitigation Benchmarking.” 2022. (Short Talk)
26. *MIDAS Future Leaders Summit*. “Multiaccurate Proxies for Downstream Fairness.” 2022. (Lightning Talk)
27. *Rutgers Conference on Advances in Bayesian and Frequentist Statistics*. “Multiaccurate Proxies for Downstream Fairness.” 2022. (Poster)
28. *EECS Rising Stars 2021*. “Multiaccurate Proxies for Downstream Fairness.” 2021. (Poster)
29. *AMLC 2021 Workshop on Trustworthy AI*. “Multiaccurate Proxies for Downstream Fairness.” 2021. (Talk)
30. *Lawrence D. Brown Distinguished Lecture and Student Workshop*. “Multiaccurate Proxies for Downstream Fairness.” 2021. (Talk)
31. *2nd Symposium on Foundations of Responsible Computing (FORC 2021)*. “Lexicographically Fair Learning: Algorithms and Generalization.” 2021. (Long Talk)
32. *AAAI/ACM Conference on Artificial Intelligence, Ethics and Society*. “Minimax Group Fairness: Algorithms and Experiments.” 2021. (Short Talk, Long Talk, Poster)
33. *ALT Mentorship Workshop*. “Minimax and Lexicographically Fair Learning: Algorithms, Experiments, and Generalization.” 2021. (Talk Dissection)

34. *AMLC Workshop on Fairness and Bias in AI*. “Convergent Algorithms for (Relaxed) Minimax Fairness.” 2020. (Talk)
35. *6th Annual Bloomberg-Columbia Machine Learning in Finance*. “Optimal, Truthful, and Private Securities Lending.” 2020. (Invited Talk)
36. *Joint Statistical Meetings, Philadelphia, PA*. “Is Anemia Prevalence a Good Proxy for Malaria Prevalence for Children? A Community-Level Perspective via Matched Logistic Regression.” 2020. (Talk)
37. *NeuRIPS Workshop on Robust AI in Financial Services: Data, Fairness, Explainability, Trustworthiness, and Privacy, Vancouver, CA*. “Optimal, Truthful, and Private Securities Lending.” 2019. (Spotlight Talk)
38. *Grace Hopper Celebration of Women in Computing, Houston, TX*. “Domain Decomposition with Recursive Inertial Bisection.” 2016. (Poster)

Teaching

Machine Learning Fundamentals (Mini 2 2024, Masters of Science in Business Analytics)

End-to-End Business Analytics (Fall 2024, Undergraduate)

Service

Journal of the Royal Statistical Society: Series B Referee (2025)

AISTATS Program Committee (2024, 2025)

AAAI Program Committee (2024, 2025)

Tepper Operations Research Seminar Co-Coordinator (2024)

Balas Award Committee Co-Chair (2024)

K&L Gates Fellowship Advisory Committee (2024)

4th Workshop on Adversarial Robustness In the Real World (AROW) at ICCV External Reviewer (2023)

Pattern Recognition Letters Reviewer (2023)

TheWebConf External Reviewer (2023)

FAccT Program Committee Member (2022, 2023)

UpML Workshop at ICML Program Committee Member (2022)

SEAS Center on Safe, Explainable, and Trustworthy AI-enabled Systems Member (2022)

Invited Contributor: Exchanges Cover of the SIGecom Winter Meeting on Algorithmic Fairness (2022)

AMLC Workshop on Trustworthy AI External Reviewer (2021)

FORC External Reviewer (2021)

Wharton Doctoral Program Student Representative (2021)

Wharton Doctoral Program Peer Mentor (2020-present)

Stanford Women in Mathematics Mentoring (2017)

LLNL Division Representative for Girls Who Code (2016-2017)

Other

Center for Intelligent Business “Conversations with Faculty Experts” Interview (2024)

Panelist for Carnegie Mellon Business Association Information Event about Tepper Research (2024)

Panelist for Society of Business Ethics Panel on “Algorithmic Fairness and Business Ethics” (2024)

Two Patents Filed (2021)

University of Pennsylvania Center for Teaching and Learning Teaching Certification (2022)

References

Available upon request