Sorelle A. Friedler
Shibulal Family Associate Professor of Computer Science

Department of Computer Science, Haverford College
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RESEARCH INTERESTS

The fairness, explainability, and societal impact of machine learning, in contexts from criminal justice to materials discovery to AI policy.

APPOINTMENTS

Haverford College

Shibulal Family Associate Professor of Computer Science	July 2022 - present
Associate Professor of Computer Science	July 2020 - present
Assistant Professor of Computer Science	July 2014 - June 2020
Visiting Assistant Professor of Computer Science	July 2012 - June 2014

White House Office of Science and Technology Policy

Assistant Director for Data and Democracy	July 2021 - December 2022

Data & Society Research Institute

Senior Policy Fellow	June 2023 - present
Affiliate	September 2016 - July 2021
Fellow	September 2015 - September 2016

Alphabet, Inc. (formerly Google, Inc.)   August 2010 - June 2012
Software Engineer, Search Infrastructure (Google) and X (formerly Google [x])

EDUCATION

University of Maryland, College Park, MD   **Ph.D.**   August 2005 - August 2010
Computer Science.
Thesis title: *Geometric Algorithms for Objects in Motion*. Advisor: David M. Mount.

University of Maryland, College Park, MD   **M.S.**   August 2005 - December 2007
Computer Science.

Swarthmore College, Swarthmore, PA   **B.A.**   August 2000 - May 2004
Computer Science. Minor: Mathematics.

GRANTS

NSF IIS-1955321   2020 - 2024
III: Medium: Collaborative Research: Evaluating and Maximizing Fairness in Information Flow on Networks. Suresh Venkatasubramanian, Aaron Clauset, Carlos Scheidegger, and Sorelle Friedler. $995,908. (Haverford portion: $128,670).

DARPA Synergistic Discovery and Design (SD2)   2018 - 2023
TA2+TA3: Discovering Reactions and Uncovering Mechanisms of Hybrid Organohalide Perovskite Formation. Joshua Schrier, Sorelle Friedler, and Alexander Norquist. $7.4M.

Mozilla Responsible Computer Science Challenge 2019 - 2021
Responsible Problem Solving: Focusing on the societal consequences of design choices in data structures and algorithms. Suresh Venkatasubramanian, Sorelle Friedler, and Seny Kamara. $312,000 (Haverford portion: $83,524).

NSF DMR-1709351 2017 - 2021
CDS&E: D3SC: The Dark Reaction Project: A machine-learning approach to exploring structural diversity in solid state synthesis. Joshua Schrier, Sorelle Friedler, and Alexander Norquist. $645,288.

LinkedIn Data Access Award 2018 - 2020
Gaining access to hard-to-reach and disadvantaged populations via controlled interventions in the economic graph. Suresh Venkatasubramanian, danah boyd, and Sorelle Friedler. Non-monetary data access grant.

NSF IIS-1633387 2016 - 2020
BIGDATA: Collaborative Research: F: Algorithmic Fairness: A Systemic and Foundational Treatment of Nondiscriminatory Data Mining. Suresh Venkatasubramanian, danah boyd, and Sorelle Friedler. $953,432 (Haverford portion: $172,742).

Knight News Challenge Prototype Fund 2016
Could your data discriminate? Sorelle Friedler, Wilneida Negron, Surya Mattu, Suresh Venkatasubramanian. $35,000.

Data & Society Research Institute Fellow 2015 - 2016
Preventing Discrimination in Machine Learning: from theory to law and policy. $10,000.

NSF DMR-1307801 2013 - 2016
The Dark Reaction Project: a machine learning approach to materials discovery. Joshua Schrier, Alexander Norquist, and Sorelle Friedler. $299,998.

AWARDS

Chace/Parker Teaching Award 2019 - 2020
The Chace/Parker Annual Endowed Haverford College Teaching Award is used to honor the outstanding teaching contributions of a Haverford College professor during a given year. The award of $3,000 is given to only one professor a year.

Ann G. Wylie Dissertation Fellowship 2009 - 2010
Provides tuition, stipend, and health insurance for one semester. Awarded to "outstanding students working on the final stages of their dissertations."

AT&T Labs Fellowship Program 2006 - 2009
Provides tuition, stipend, health insurance, and conference funds for 3 years. Awarded to 5 "outstanding under-represented minority and women students" chosen from a national pool.

Verizon Fellowship 2006 - 2007
Monetary award for outstanding academic achievement.

Graduate School Fellow, University of Maryland 2005 - 2007
Monetary award for "academic merit, intellectual ability, and the student's potential to make a unique contribution to the diversity of the educational experience on this campus."

PAPERS   *Many author orderings are alphabetical. Haverford undergraduate co-authors are denoted with a *.*

White House Reports

[WH] The White House Office of Science and Technology Policy. Blueprint for an AI Bill of Rights: Making Automated Systems Work for the American People. Oct. 4, 2022. `https://www.whitehouse.gov/ostp/ai-bill-of-rights`

- Alondra Nelson, Sorelle Friedler, and Ami Fields-Meyer. Blueprint for an AI Bill of Rights: A Vision for Protecting Our Civil Rights in the Algorithmic Age. White House Office of Science and Technology Policy. Oct. 4, 2022. `https://www.whitehouse.gov/ostp/news-updates/2022/10/04/blueprint-for-an-ai-bill-of-rightsa-vision-for-protecting-our-civil-rights-in-the-algorithmic-age/`
- The White House. FACT SHEET: Biden-Harris Administration Announces Key Actions to Advance Tech Accountability and Protect the Rights of the American Public. Oct. 4, 2022. `https://www.whitehouse.gov/ostp/news-updates/2022/10/04/fact-sheet-biden-harris-administration-announces-key-actions-to-advance-tech-accountability-and-protect-the-rights-of-the-american-public/`

Peer-reviewed Journal Papers

[J1] Venkateswaran Shekar, Gareth Nicholas*, Mansoor Ani Najeeb, Margaret Zeile, Vincent Yu*, Xiaorong Wang*, Dylan Slack*, Zhi Li, Philip W. Nega, Emory Chan, Alexander J. Norquist, Joshua Schrier, and Sorelle A. Friedler. Active Meta-Learning for Predicting and Selecting Perovskite Crystallization Experiments. *The Journal of Chemical Physics*, Feb. 14, 2022.

[J2] Sorelle A. Friedler, Carlos Scheidegger, and Suresh Venkatasubramanian. The (im)possibility of fairness: different value systems require different mechanisms for fair decision making. *Communications of the ACM*, April, 2021.

[J3] Xiwen Jia*, Oscar Huang*, Allyson Lynch*, Matthew Danielson*, Immaculate Lang'at*, Alexander Milder*, Aaron Ruby*, Hao Wang*, Sorelle A. Friedler, Alexander J. Norquist, and Joshua Schrier. Anthropogenic biases in chemical reaction data hinder exploratory inorganic synthesis. *Nature*, 573: 251–255, Sept. 12, 2019.

[J4] Ian Pendleton, Gary Cattabriga, Zhi Li, Mansoor Ani Najeeb, Sorelle Friedler, Alexander Norquist, Emory Chan, and Joshua Schrier. Experiment Specification, Capture and Laboratory Automation Technology (ESCALATE): A software pipeline for automated chemical experimentation and data management. *MRS Communications* (Special Issue Research Letter: Artificial Intelligence), forthcoming 2019.

[J5] Harry Levin* and Sorelle A. Friedler. Automated Congressional Redistricting. *ACM Journal of Experimental Algorithmics*, 24.1 (2019): 1-10.

[J6] Philip Adler, Casey Falk*, Sorelle A. Friedler, Tionney Nix*, Gabriel Rybeck*, Carlos Scheidegger, Brandon Smith*, and Suresh Venkatasubramanian. Auditing Black-box Models for Indirect Influence. *Knowledge and Information Systems*, 54.1 (2018): 95-122.

   ⭐ **2021 Knowledge and Information Systems Best Paper Award**

[J7] Paul Raccuglia*, Katherine C. Elbert*, Philip D. F. Adler, Casey Falk*, Malia B. Wenny*, Aurelio Mollo*, Matthias Zeller, Sorelle A. Friedler, Joshua Schrier, and Alexander J. Norquist. Machine-learning-assisted materials discovery using failed experiments. *Nature*, 533: 73 - 76, May 5, 2016.

[J8] Sorelle A. Friedler and David M. Mount. A Sensor-Based Framework for Kinetic Data Compression. *Computational Geometry: Theory and Applications*, 48(3): 147 - 168, March 2015

[J9] Sorelle A. Friedler and David M. Mount. Approximation algorithm for the kinetic robust k-center problem. *Computational Geometry: Theory and Applications*, 43(6-7):572 - 586, 2010.

[J10] Sorelle A. Friedler, Yee Lin Tan, Nir J. Peer, and Ben Shneiderman. Enabling teachers to explore grade patterns to identify individual needs and promote fairer student assessment. *Computers & Education*, 51(4): 1467 - 1485, December 2008.

Peer-reviewed Conference Proceedings

[C1] Mohsen Abbasi, Calvin Barrett*, Sorelle A. Friedler, Kristian Lum, Suresh Venkatasubramanian. Measuring and mitigating voting access disparities: a study of race and polling locations in Florida and North Carolina. *Conference on Fairness, Accountability, and Transparency (FAccT)*, 2023. (Acceptance rate: 25%)

[C2] Ashkan Bashardoust, Sorelle A. Friedler, Carlos Scheidegger, Blair D. Sullivan and Suresh Venkatasubramanian. Reducing Access Disparities in Networks using Edge Augmentation. *Conference on Fairness, Accountability, and Transparency (FAccT)*, 2023. (Acceptance rate: 25%)

[C3] Lydia Reader, Pegah Nokhiz, Cathleen Power, Neal Patwari, Suresh Venkatasubramanian, and Sorelle A. Friedler. Models for understanding and quantifying feedback in societal systems. *Conference on Fairness, Accountability, and Transparency (FAccT)*, 2022. (Acceptance rate: 25%)

[C4] I. Elizabeth Kumar, Carlos Scheidegger, Suresh Venkatasubramanian, and Sorelle A. Friedler. Shapley Residuals: Quantifying the limits of the Shapley value for explanations. In *Neural Information Processing Systems (NeurIPS)*, 2021. (Acceptance rate: 26%)

[C5] I. Elizabeth Kumar, Suresh Venkatasubramanian, Carlos Scheidegger, and Sorelle A. Friedler. Problems with Shapley-value-based explanations as feature importance measures. In *International Conference on Machine Learning (ICML)*, 2020. (Acceptance rate: 22%)

[C6] Dylan Slack*, Sorelle A. Friedler, and Emile Givental*. Fairness Warnings and Fair-MAML: Learning Fairly with Minimal Data. In *Conference on Fairness, Accountability, and Transparency (FAccT)*, 2020. (Acceptance rate: 24%)

[C7] Charles Marx*, Richard Phillips*, Sorelle A. Friedler, Carlos Scheidegger, and Suresh Venkatasubramanian. Disentangling Influence: Using disentangled representations to audit model predictions. In *Neural Information Processing Systems (NeurIPS)*, 2019. (Acceptance rate: 21%)

[C8] Benjamin Fish, Ashkan Bashardoust, danah boyd, Sorelle Friedler, Carlos Scheidegger and Suresh Venkatasubramanian. Gaps in Information Access in Social Networks. In *The Web Conference (WWW)*, 2019. (Acceptance rate: 18%)

[C9] Mohsen Abbasi, Sorelle A. Friedler, Carlos Scheidegger, and Suresh Venkatasubramanian. Fairness in representation: Quantifying stereotyping as a representational harm. In *SIAM International Conference on Data Mining (SDM)*, 2019. (Acceptance rate: 23%)

[C10] Sorelle A. Friedler, Carlos Scheidegger, Suresh Venkatasubramanian, Sonam Choudhary, Evan P. Hamilton*, and Derek Roth*. A comparative study of fairness-enhancing interventions in machine learning. In *Proceedings of the Conference on Fairness, Accountability, and Transparency (FAccT)*, 2019. (Acceptance rate: 24%)

[C11] Andrew Selbst, danah boyd, Sorelle A. Friedler, Suresh Venkatasubramanian, and Janet A. Vertesi. Fairness and Abstraction in Sociotechnical Systems. In *Proceedings of the Conference on Fairness, Accountability, and Transparency (**FAccT**)*, 2019. (Acceptance rate: 24%)

[C12] Danielle Ensign, Sorelle A. Friedler, Scott Neville, Carlos Scheidegger, Suresh Venkatasubramanian. Decision Making with Limited Feedback: Error bounds for Recidivism Prediction and Predictive Policing. In *Algorithmic Learning Theory (**ALT**)* 2018. (Acceptance rate: 35%)

[C13] Danielle Ensign, Sorelle A. Friedler, Scott Neville, Carlos Scheidegger and Suresh Venkatasubramanian. Runaway Feedback Loops in Predictive Policing. In *Proceedings of the Conference on Fairness, Accountability, and Transparency (**FAccT**)*, 2018. (Acceptance rate: 24%)

[C14] Richard L. Phillips*, Kyu Hyun Chang*, and Sorelle A. Friedler. Interpretable Active Learning. In *Proceedings of the Conference on Fairness, Accountability, and Transparency (**FAccT**)*, 2018. (Acceptance rate: 24%)

[C15] Philip Adler, Casey Falk*, Sorelle A. Friedler, Gabriel Rybeck*, Carlos Scheidegger, Brandon Smith*, and Suresh Venkatasubramanian. Auditing Black-box Models for Indirect Influence. In *Proceedings of the IEEE International Conference on Data Mining (**ICDM**)*, 2016. (Acceptance rate: 20%, acceptance as regular paper: 8.5%.)

> Expanded version available as part of: Auditing Black-box Models for Indirect Influence, *Knowledge and Information Systems*.

[C16] F. Betul Atalay, Sorelle A. Friedler, and Dianna Xu. Convex hull for probabilistic points. In Technical Papers of the 29th Conference on Graphics, Patterns and Images (**SIBGRAPI** '16), 2016. (Acceptance rate: 43%.)

[C17] Michael Feldman*, Sorelle A. Friedler, John Moeller, Carlos Scheidegger, and Suresh Venkatasubramanian. Certifying and Removing Disparate Impact. In *Proceedings of the ACM International Conference on Knowledge Discovery and Data Mining (**KDD**)*, pages 259–268, 2015. (Acceptance rate: 19%.)

[C18] Sorelle A. Friedler and David M. Mount. Spatio-temporal Range Searching over Compressed Kinetic Sensor Data. In *Proc. of the European Symposium on Algorithms (**ESA**)*, pages 386 - 397, 2010. (Acceptance rate: 27%.)

[C19] Sorelle A. Friedler and David M. Mount. Compressing kinetic data from sensor networks. In *Proc. of the Fifth International Workshop on Algorithmic Aspects of Wireless Sensor Networks (**AlgoSensors**)*, pages 191 - 202, 2009. (Acceptance rate: 51%.)

> Expanded version available as part of: A Sensor-Based Framework for Kinetic Data Compression, *Computational Geometry: Theory and Applications*.

Policy-related Publications

[P1] Data & Society. Response to "Request for Information; National Priorities for Artificial Intelligence." July 7, 2023. `https://datasociety.net/wp-content/uploads/2023/07/Data-Society-OSTP-National-AI-Strategy-Comment.pdf`

[P2] Janet Haven and Sorelle Friedler. The Senate doesn't need to start from scratch on AI legislation. *The Hill*, July 1, 2023. `https://thehill.com/opinion/technology/4076112-the-senate-doesnt-need-to-start-from-scratch-on-ai-legislation/`

[P3] AI Policy and Governance Working Group. Response to the NTIA AI Accountability Policy Request for Comment. June 12, 2023. `https://www.ias.edu/sites/default/files/AI%20Policy% 20and%20Governance%20Working%20Group%20NTIA%20Comment.pdf`

[P4] Sorelle Friedler, Suresh Venkatasubramanian, and Alex Engler. How California and other states are tackling AI legislation. *Brookings*, Mar. 22, 2023. `https://www.brookings.edu/blog/techtank/ 2023/03/22/how-california-and-other-states-are-tackling-ai-legislation/`

[P5] Nicholas Diakopoulos and Sorelle Friedler. How to Hold Algorithms Accountable. *MIT Technology Review*, Nov. 17, 2016. `https://www.technologyreview.com/s/602933/how-to-hold- algorithms-accountable/`

Workshop Papers and Technical Reports

[TR1] Venkateswaran Shekar, Vincent Yu, Benjamin J Garcia, David Benjamin Gordon, Gemma E Moran, David M Blei, Loïc M Roch, Alberto García-Durán, Mansoor Ani Najeeb, Margaret Zeile, Philip W Nega, Zhi Li, Mina A Kim, Emory M Chan, Alexander J Norquist, Sorelle Friedler, and Joshua Schrier. Serendipity based recommender system for perovskites material discovery: balancing exploration and exploitation across multiple models. ChemRxiv. July 19, 2022. `https://chemrxiv. org/engage/chemrxiv/article-details/62d71c6281efd08b4ab2e7eb`

[TR2] Kathi Fisler, Sorelle Friedler, Kevin Lin, Suresh Venkatasubramanian. Approaches for Weaving Responsible Computing into Data Structures and Algorithms Courses. In *Proceedings of the 53rd ACM Technical Symposium on Computer Science Education (**SigCSE**)*, pages 1049-1050, Mar. 3, 2022. `https://dl.acm.org/doi/abs/10.1145/3478432.3499222`

[TR3] Hannah C. Beilinson*, Nasanbayar Ulzii-Orshikh*, Ashkan Bashardoust, Sorelle A. Friedler, Carlos E. Scheidegger, Suresh Venkatasubramanian. Clustering via Information Access in a Network. arXiv:2010.12611, Oct. 23, 2020. `https://arxiv.org/abs/2010.12611`

[TR4] I. Elizabeth Kumar, Carlos Scheidegger, Suresh Venkatasubramanian, and Sorelle Friedler. Shapley Residuals: Quantifying the limits of the Shapley value for explanations. *ICML Workshop on Workshop on Human Interpretability in Machine Learning (**WHI**)*, 2020.

> Expanded version available as part of: Problems with Shapley-value-based explanations as feature importance measures. In *International Conference on Machine Learning (**ICML**)*, 2020.

[TR5] Dylan Slack*, Sorelle Friedler and Emile Givental*. Fairness Warnings. *NeurIPS Workshop on Human-Centric Machine Learning (**HCML**)*, 2019.

[TR6] Dylan Slack*, Sorelle Friedler and Emile Givental*. Fair Meta-Learning: Learning How to Learn Fairly. *NeurIPS Workshop on Human-Centric Machine Learning (**HCML**)*, 2019.

> Expanded version of above two papers available as: Fairness Warnings and Fair-MAML: Learning Fairly with Minimal Data, *Conference on Fairness, Accountability, and Transparency (**FAccT**)*, 2020.

[TR7] Dylan Slack*, Sorelle A. Friedler, Chitradeep Dutta Roy, and Carlos Scheidegger. Assessing the Local Interpretability of Machine Learning Models. *NeurIPS Workshop on Human-Centric Machine Learning (**HCML**)*, 2019. `https://arxiv.org/abs/1902.03501`

[TR8] Kadan Lottick*, Silvia Susai*, Sorelle Friedler, and Jonathan Wilson. Energy Usage Reports: Environmental awareness as part of algorithmic accountability. *NeurIPS Workshop on Tackling Climate*

Change with Machine Learning, 2019.

[TR9] Danielle Ensign, Sorelle A. Friedler, Scott Neville, Carlos Scheidegger and Suresh Venkatasubramanian. Runaway Feedback Loops in Predictive Policing. Presented as a talk at the *Fairness, Accountability, and Transparency in Machine Learning Workshop (FAT/ML)*, Aug. 14, 2017.

> Expanded version available as part of: Runaway Feedback Loops in Predictive Policing, *Proceedings of the Conference on Fairness, Accountability, and Transaprency (FAccT)*, 2018.

[TR10] Danielle Ensign, Sorelle Friedler, Scott Neville, Carlos Scheidegger and Suresh Venkatasubramanian. Decision Making with Limited Feedback: Error bounds for Recidivism Prediction and Predictive Policing. Presented as a poster at the *Fairness, Accountability, and Transparency in Machine Learning Workshop (FAT/ML)*, Aug. 14, 2017.

> Expanded version available as part of: Error bounds for Recidivism Prediction and Predictive Policing, *Proceedings of Algorithmic Learning Theory (ALT)*, 2018.

[TR11] Richard L. Phillips*, Kyu Hyun Chang*, and Sorelle A. Friedler. Interpretable Active Learning. Presented at the *ICML Workshop on Human Interpretability in Machine Learning (WHI)*, Aug. 10, 2017.

> Expanded version available as part of: Interpretable Active Learning, *Proceedings of the Conference on Fairness, Accountability, and Transaprency (FAccT)*.

[TR12] Sorelle A. Friedler, Carlos Scheidegger, and Suresh Venkatasubramanian. On the (im)possibility of fairness. arXiv:1609.07236, Sept. 23, 2016. `http://arxiv.org/abs/1609.07236`

> Modified version available as: The (im)possibility of fairness: different value systems require different mechanisms for fair decision making. *Communications of the ACM*, April, 2021.

[TR13] Nicholas Diakopoulos, Sorelle Friedler, Marcelo Arenas, Solon Barocas, Michael Hay, Bill Howe, HV Jagadish, Kris Unsworth, Arnaud Sahuguet, Suresh Venkatasubramanian, Christo Wilson, Cong Yu, and Bendert Zevenbergen. Principles for accountable algorithms and a social impact statement for algorithms. *Dagstuhl working group write-up*. July, 2016. Available at: `https://www.fatml.org/resources/principles-for-accountable-algorithms`

> *How to Hold Algorithms Accountable* is a description of this work for the public.

[TR14] Ifeoma Ajunwa, Sorelle Friedler, Carlos E. Scheidegger, and Suresh Venkatasubramanian. Hiring by Algorithm: Predicting and Preventing Disparate Impact. Presented at the Yale Law School Information Society Project conference *Unlocking the Black Box: The Promise and Limits of Algorithmic Accountability in the Professions*, Apr. 2, 2016.

> This is a translation of the paper *Certifying and Removing Disparate Impact* for a legal audience.

[TR15] Michael Feldman*, Sorelle A. Friedler, John Moeller, Carlos Scheidegger, and Suresh Venkatasubramanian. Certifying and Removing Disparate Impact. Presented at the *Fairness, Accountability, and Transparency in Machine Learning Workshop (FAT/ML)*, Dec. 12, 2014. `http://arxiv.org/abs/1412.3756`

> Expanded version available as part of: Certifying and Removing Disparate Impact, in *Proceedings of the 21st ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*.

[TR16] F. Betul Atalay, Sorelle A. Friedler, and Dianna Xu. Probabilistic Kinetic Data Structures. Presented at the *Fall Workshop on Computational Geometry*, Oct. 25, 2013. `http://arxiv.org/abs/1412.1039`

> Expanded version available as part of: Convex Hull for Probabilistic Points, in *Proceedings of the Brazilian Symposium on Computer Graphics and Image Processing (SIBGRAPI)*.

[TR17] Sorelle A. Friedler and David M. Mount. Spatio-temporal Range Searching Over Compressed Kinetic Sensor Data. *Second Workshop on Massive Data Algorithms (**MASSIVE** 2010)*, June 17, 2010.

> Expanded version available as part of: Spatio-temporal Range Searching over Compressed Kinetic Sensor Data, in *Proc. of the European Symposium on Algorithms (ESA)*.

[TR18] Sorelle A. Friedler and David M. Mount. Realistic Compression of Kinetic Sensor Data. *University of Maryland Computer Science Department*, Technical Report CS-TR-4959, June 6, 2010. `http://hdl.handle.net/1903/10114`

> Expanded version available as part of: A Sensor-Based Framework for Kinetic Data Compression, *Computational Geometry: Theory and Applications*.

Thesis

Sorelle A. Friedler. Geometric Algorithms for Objects in Motion. Dissertation committee: Prof. David Mount (chair), Prof. William Gasarch, Prof. Samir Khuller, Prof. Steven Selden, Prof. Amitabh Varshney. Defense date: July 30, 2010.

Book Reviews

Sorelle A. Friedler. Review of Pioneering Women in American Mathematics: the Pre-1940 PhD's by Judy Green and Jeanne LaDuke. SIGACT News 42(2): 37-41, 2011.

Sorelle A. Friedler. Review of Change is Possible: Stories of Women and Minorities in Mathematics by Patricia Clark Kenschaft. SIGACT News 41(2): 47-50, 2010.

PATENTS

Sorelle Alaina Friedler, Mohammed Waleed Kadous, Andrew Lookingbill. *Position indication controls for device locations*. US 20130131973 A1 (also WO 2013078125 A1). Publication date: May 23, 2013.

Mohammed Waleed Kadous, Isaac Richard Taylor, Cedric Dupont, Brian Patrick Williams, Sorelle Alaina Friedler. *Permissions based on wireless network data*. US 20130244684 A1 (also WO2013138304 A1). Publication date: Sep 19, 2013.

KEYNOTE TALKS

Fordham Data Science Symposium: Doing good with data,   Apr. 11, 2023
Fordham University, NY
Blueprint for an AI Bill of Rights

Symp. on Data Science, AI, and a Sustainable, Resilient, and Equitable Future,   Oct. 13, 2022
Pennsylvania State University, State College, PA
Blueprint for an AI Bill of Rights: Making automated systems work for the American people
Participated in my White House capacity.

Atlantic Council AI Connect Network Webinar, remote   May 26, 2022
Human-centered Implementation of AI Technologies
Participated in my White House capacity.

Teaching Machine Learning Workshop at ECML, remote   Sept. 8, 2021
Embedding Ethics in Data Structures Classes

Machines, Minds, and Morality: Ethics in a Changing Technological World   April 5, 2019
Rosemont College, Rosemont, PA
Fairness and Abstraction: algorithmic discrimination and attempts to address it

Scandinavian Symposium and Workshops on Algorithm Theory (SWAT)   June 18, 2018
Malmö, Sweden
Optimizing Society? Ensuring Fairness in Automated Decision-Making

NSF Workshop on Data Science for Secure and Privacy-aware (DSSP)   Sept. 26, 2016
Large Data Management and Mining, Snowbird, UT
Algorithmic Fairness: Guaranteeing fairness and non-discrimination
in machine-learned decision making

INVITED TALKS

National Council of State Legislatures,   June 2, 2023
Cybersecurity Task Force and Privacy Work Group, Providence, RI
Anatomy of an Artificial Intelligence System

Colby College, Distinguished Speaker Series, Waterville, ME   Apr. 13, 2023
Blueprint for an AI Bill of Rights: protecting people and innovation

University of Washington, Responsibility in AI Systems & Experiences Seminar   Feb. 10, 2023
remote
Blueprint for an AI Bill of Rights

Santa Fe Institute Seminar, remote   May 5, 2021
Fairness in Networks: Information access, disadvantage, and clustering

The Ohio State University, Perspectives in AI Seminar Series, remote   Dec. 8, 2020
Fairness in Networks: Information access, disadvantage, and clustering

Saint Louis University, CS Department Colloquium, remote   Oct. 12, 2020
Algorithms in Criminal Justice: problems with predictive policing

University of Pennsylvania School of Social Policy and Practice,   Mar. 4, 2020
Social Policy Speaker Series, Philadelphia, PA,
Algorithms in Criminal Justice: the problems with risk assessments and predictive policing

Cornell Tech, Digital Life Seminar Series, New York, NY   Oct. 17, 2019
Fairness in Networks: Understanding disadvantage and information access

Haverford College, D3 Talk, Haverford, Pa   Nov. 28, 2018
Algorithmic Fairness: how automated decision-making perpetuates
discrimination and what we can do about it

Columbia University, Data Science Institute, NY, NY   Apr. 6, 2018
Auditing, Explaining, and Ensuring Fairness in Algorithmic Systems

University of Pennsylvania, Theoretical Computer Science Seminar   Feb. 9, 2018
Philadelphia, PA
Feedback Loops in Predictive Policing

University of Minnesota, Institute for Advanced Study, Minneapolis, MN Jan. 25, 2018
Auditing, Explaining, and Ensuring Fairness in Algorithmic Systems

Rutgers University DIMACS REU, New Brunswick, NJ   June 13, 2017
Auditing Black-box Models

Brown University, Providence, RI   Mar. 9, 2017
Algorithmic Fairness: Guaranteeing fairness and non-discrimination
in machine-learned decision making

Rutgers / Bryn Mawr Undergraduate Workshop, Camden, NJ   July 25, 2016
Data Structures for Kinetic Multidimensional Point Sets

Consumer Financial Protection Bureau, Washington, DC   May 5, 2016
Biased Data, Biased Algorithms:
Detecting and Preventing Discrimination in Machine-Learned Decisions

Williams College, Computer Science Dept. Colloquium, Williamstown, MA Apr. 15, 2016
Biased Data, Biased Algorithms:
Detecting and Preventing Discrimination in Machine-Learned Decisions

Microsoft Research, NY, NY   Jan. 14, 2016
Detecting and Preventing Discrimination in Machine-Learned Decisions

Arcadia University Mathematics Education Colloquium, Glenside, PA   Feb. 19, 2009
How do Computers Solve Geometric Problems?

CONTRIBUTED TALKS (conferences and workshops)

Conference on Fairness, Accountability, and Transparency, Chicago, IL June 14, 2023
Measuring and mitigating voting access disparities

Symposium on Computer Science Education, remote   Mar. 4, 2022
Approaches for Weaving Responsible Computing into
Data Structures and Algorithms Courses (panel)

Networked Justice: A Networks 2021 Satellite Symposium, remote   June 28, 2021
A Case for Community-Based Notions of Fairness

Law + Computation: An Algorithm for the Rule of Law and Justice?   Feb. 5, 2021
Northwestern University, remote
Predicting what? Accountability for risk assessments

Leveraging AI and ML to Advance Environmental Health Research and Decisions   Jun. 7, 2019
National Academy of Sciences, Washington, DC
Interpretable Machine Learning for Scientific Understanding

Machine Learning and Informatics for Chemistry and Materials, Telluride, CO   Oct. 1, 2018
Interpretable Machine Learning for Scientific Discovery

Google Workshop on Fairness in Machine Learning, Cambridge, MA   Sept. 13, 2018
Fairness definitions from an axiomatic and representational perspective

CCC Workshop on Fair Representations and Fair Interactive Learning   Mar. 18, 2018
Philadelphia, PA
Fair Representations: making our values explicit

Fairness, Accountability, and Transparency in Machine Learning,   Aug. 14, 2017
Halifax, NS, Canada
Runaway Feedback Loops in Predictive Policing

International Workshop on Obfuscation: Science, Technology, and Theory   Apr. 7, 2017
New York University, NY, NY
Obfuscating Data to Prevent Discrimination

AALAC Workshop on Data Ethics, Pomona College, Claremont, CA   Feb. 10, 2017
Algorithmic Fairness

Fairness for Digital Infrastructure Workshop, UPenn, Philadelphia, PA   Jan. 20, 2017
On the (Im)possibility of Fairness

IEEE International Conference on Data Mining, Barcelona, Spain   Dec. 14, 2016
Auditing Black-box Models for Indirect Influence

SIBGRAPI Conference on Graphics, Patterns and Images,   Oct. 5, 2016
São José dos Campos, Brazil
Convex Hull for Probabilistic Points

Dagstuhl Seminar on Data, Responsibly, Wadern, Germany   July 19, 2016
Auditing Black-box Models

Data & Society Workshop, NY, NY   May 16, 2016
Hiring by Algorithm: Predicting and Preventing Disparate Impact

National Council on Measurement in Education, Washington, DC   Apr. 9, 2016
Fairness and Machine Learning for Educational Practice (panel)

Yale Law, Unlocking the Black Box, New Haven, CT   Apr. 2, 2016
Hiring by Algorithm: Predicting and Preventing Disparate Impact

Fairness, Accountability, and Transparency in Machine Learning,   Dec. 12, 2014
Montreal, Canada
Certifying and Removing Disparate Impact

Fall Workshop on Computational Geometry, NY, NY   Oct. 25, 2013
Probabilistic Kinetic Data Structures

AALAC/Mellon 23 Working Group on Information, Bryn Mawr College, PA   Oct. 27, 2012
Information Content in Motion

European Symposium on Algorithms (ESA 2010), Liverpool, UK   Sept. 7, 2010
Spatio-temporal Range Searching Over Compressed Kinetic Sensor Data

Second Workshop on Massive Data Algorithms (MASSIVE 2010),   June 17, 2010
Snowbird, Utah
Spatio-temporal Range Searching Over Compressed Kinetic Sensor Data

Fifth International Workshop on Algorithmic Aspects of   July 11, 2009
Wireless Sensor Networks, Rhodes, Greece
Compressing Kinetic Data From Sensor Networks

AT&T Research Lab Colloquium, Florham Park, NJ   Aug. 11, 2006
An Implementation of Jain's Algorithm for Survivable Network Design.

PEDAGOGICAL / GENERAL AUDIENCE TALKS

Conference on Fairness, Accountability, and Transparency, Chicago, IL   June 15, 2023
Conversation with US Equal Employment Opportunity Commission (EEOC) Chair,
Charlotte Burrows: Civil Rights and AI in Employment. Led keynote conversation.

Conference on Fairness, Accountability, and Transparency, Chicago, IL   June 13, 2023
AI Governance and Policy in the US - Spotlight on the Blueprint for an
AI Bill of Rights 45-minute tutorial

Conference on Fairness, Accountability, and Transparency, Chicago, IL   June 12, 2023
From Research Insight to Policy Impact - How You Can Engage in Current
AI Policy Debates (panel)

Institute for Advanced Study, Princeton, NJ   June 6, 2023
Steering AI for the Public Good: a dialogue for the future (panel)

Princeton Center for Information Technology Digital Investigators Conference,   May 4, 2023
Princeton, NJ
Confused by All the Chatter? Journalists, Researchers & Policymakers Talk
Chatbots and Other Large Language Models (panel)

UNESCO Commission on the Status of Women - side event, New York, NY   Mar. 6, 2023
The Gender Digital Revolution: Addressing ethics of Artificial Intelligence,
access to information and gendered online violence (panel)

Unpacking the White House Blueprint for an AI Bill of Rights,   Dec. 5, 2022
Brookings Institute, Washington, DC
Opening remarks and panel discussion
Participated in my White House capacity.

OECD Working Group on AI, remote   Nov. 8, 2022
Blueprint for an AI Bill of Rights
Participated in my White House capacity.

NSF Fairness in AI PI Meeting, remote — Jul. 5, 2022
Improving the Policy and Practical Impact of Fair-AI (panel)
Participated in my White House capacity.

Mozilla Meetups, remote — Jun. 9, 2022
The Building Blocks of a Trusted Internet (panel)
Participated in my White House capacity.

Carnegie Mellon University Responsible AI Initiative, remote, — Apr. 4, 2022
Launch Event (panel)
Participated in my White House capacity.

Building U.S. Leadership in Responsible AI Use, SIIA event, remote — Mar. 28, 2022
Fireside chat
Participated in my White House capacity.

Global Partnership on AI — Nov. 12, 2021
AI for Drug Discovery (panel)
Participated in my White House capacity.

Conference on Knowledge Discovery and Data Mining (KDD), remote — Aug. 14, 2021
Fairness in Networks: Social Capital, Information Access, and Interventions
90-minute tutorial.

Workshop on Data Science in the Liberal Arts, remote — Apr. 2, 2021
Integrating Data Science Ethics into Data Structures & Algorithms

MozFest, remote — Mar. 17, 2021
Responsible Computing Curricula - How do we do it? (panel)

Beth Am Israel, remote — May 14, 2020
Jewish Perspectives on the Ethics of Artificial Intelligence (panel)

McNulty Scholars Program for Excellence in Science and Mathematics, — Oct. 30, 2019
St. Joseph's University, Philadelphia, PA
Fairness and Abstraction: algorithmic discrimination and attempts to address it

IEEE Intl. Conf. on Data Science and Advanced Analytics, Washington, DC — Oct. 6, 2019
Trends and Controversies Panel: Does Data Ethics Matter? (panel)

Summer Cluster: Fairness — July 9, 2019
Simons Institute for the Theory of Computing, Berkeley, CA
Algorithmic Governance (panel)

ACM Conference on Fairness, Accountability, and Transparency, Atlanta, Ga — Jan. 29, 2019
Hands-on Tutorial: pip install fairness: a fairness-aware classification toolkit
90 minute tutorial

Philadelphia Fulbright Enrichment Seminar — Apr. 13, 2018
Philadelphia, PA
Big Data for the Public Good: Innovations in Civic Engagement (panel)

Optimizing Government: Policy Challenges in the Machine Learning Age   Mar. 21, 2017
University of Pennsylvania, Philadelphia, PA
Can Technology Be Democratic?
Transparency and Accountability in Machine Learning (panel)

Center for Information Technology Policy, Princeton University, NJ   Mar. 3, 2017
Principles for Accountable Algorithms

IEEE ICDM International Workshop on Privacy and Discrimination   Dec. 12, 2016
in Data Mining, Barcelona, Spain
Closing panel: Ethical Data Mining - Challenges and Opportunities (panel)

Workshop on Fairness, Accountability, and Transparency   Nov. 18, 2016
in Machine Learning, NY, NY
Opening Panel: Setting the Stage (panel)

Dagstuhl Seminar on Data, Responsibly, Wadern, Germany   July 21, 2016
Teaching Ethical Issues in Data Mining to Undergraduates

NYU Law, Bernstein Institute for Human Rights, NY, NY   Mar. 22, 2016
Data Hygiene and Algorithmic Oversight (panel moderator)

SXSW, Austin, TX   Mar. 13, 2016
Biased Algorithms and the Future of Prejudice (panel)

Data & Civil Rights Conference, Washington, DC   Oct. 27, 2015
Discriminatory Machine Learning

Grace Hopper Celebration of Women in Computing, Houston, TX   Oct. 15, 2015
Diverse Paths to Teaching and Research at Liberal Arts Colleges (panel)

INVITED WORKSHOPS

Community-Driven Approaches to Research in Technology & Society   May 8-9, 2023
CCC and MacArthur Workshop, Washington, DC

GAO Comptroller General Forum on AI Oversight, remote   Sept. 9 - 10, 2020

Dagstuhl Seminar on Machine Learning Meets Visualization   Nov. 3 - 8, 2019
to Make Artificial Intelligence Interpretable, Wadern, Germany

Summer Cluster: Fairness   June 24 - July 10, 2019
Simons Institute for the Theory of Computing, Berkeley, CA

Integrating Ethics and Social Responsibility into CS and Eng. Curricula   Oct. 15, 2018
Harvard Center for Research on Computation and Society, Cambridge, MA

Machine Learning and Informatics for Chemistry and Materials   Oct. 1-5, 2018
Telluride, CO

Workshop on the Limits of Artificial Intelligence in Public Policy   Sept. 28, 2018
Princeton University, Princeton, NJ

Google Workshop on Fairness in Machine Learning, Cambridge, MA	Sept. 13 - 14, 2018
Data Science Ethics Education Workshop, New York University, NY	Feb. 22, 2018
NSF BIGDATA PI Meeting, Washington, DC	Mar. 13 - 15, 2017
Fairness for Digital Infrastructure Workshop, University of Pennsylvania, Philadelphia, PA	Jan. 19 - 20, 2017
MacArthur Foundation Consultation on Opportunities and Challenges with Algorithmic Decision-Making Tools in the Criminal Justice Field, Chicago, IL	Oct. 28, 2016
USACM Algorithmic Transparency and Accountability, University of Pennsylvania, Philadelphia, PA	Oct. 27, 2016
Dagstuhl Seminar on Data, Responsibly, Wadern, Germany	July 17 - 22, 2016
Data & Civil Rights Conference, Washington, DC	Oct. 27, 2015
NSF Workshop on the Rise of Data in Materials Research, College Park, MD	June 29 - 30, 2015

SELECTED PRESS

Related to *Blueprint for an AI Bill of Rights*:

Cristiano Lima. White House unveils 'AI bill of rights' as 'call to action' to rein in tool. *The Washington Post*, Oct. 4, 2022.

Melissa Heikkilä. The White House just unveiled a new AI Bill of Rights: It's the first big step to hold AI to account. *MIT Technology Review*, Oct. 4, 2022.

Angus Loten. White House Issues 'Blueprint for an AI Bill of Rights'. *The Wall Street Journal*, Oct. 4, 2022.

Rachel Metz. The White House released an 'AI Bill of Rights'. *CNN Business*, Oct. 5, 2022.

Garance Burke. White House unveils artificial intelligence 'Bill of Rights'. *AP News*, Oct. 4, 2022.

Related to *Anthropogenic biases in chemical reaction data hinder exploratory inorganic synthesis*:

Kira Welter. Human biases cause problems for machines trying to learn chemistry. *Chemistry World*, Sept. 13, 2019.

Bob Yirka. Chemists show how bias can crop up in machine learning algorithm results. *Phys.org*, Sept. 12, 2019.

Sam Lemonick. Machine learning can have human bias: Algorithm performance suffers when humans choose how to train it. *Chemical & Engineering News*, Sept. 11, 2019.

Editorial. Look out for potential bias in chemical data sets. *Nature*, Sept. 11, 2019.

Related to *Runaway feedback loops in predictive policing*:

Ethan Baron. Bay Area police try out controversial AI software that tells them where to patrol. *The Mercury News*, Mar. 10, 2019.

Caroline Haskins. Academics Confirm Major Predictive Policing Algorithm is Fundamentally Flawed. *Motherboard*, Feb. 14, 2019.

Daniel Cossins. Discriminating algorithms: 5 times AI showed prejudice. *New Scientist*, Apr. 12, 2018.

Matt Reynolds. Biased policing is made worse by errors in pre-crime algorithms. *New Scientist*, Oct. 4, 2018.

Related to *Fairness and abstraction in sociotechnical systems*:

Tristan Greene. Why the criminal justice system should abandon algorithms. *The Next Web*, Feb 6, 2019.

Karen Hao. This is how AI bias really happens — and why it's so hard to fix. *Technology Review*, Feb. 4, 2019.

Related to *Machine-learning-assisted materials discovery using failed experiments*:

Adam Marcus and Ivan Oransky. What scientists could learn from startups. *The Week* and *STAT*, May 12, 2016.

Daniela Hernandez. Why Machines Should Learn From Failures. *The Wall Street Journal*, May 6, 2016.

Jordana Cepelewicz. Lab Failures Turn to Gold in Search for New Materials. *Scientific American*, May 6, 2016.

Philip Ball. Computer gleans chemical insight from lab notebook failures. *Nature News*, May 4, 2016.

Related to *On the (im)possibility of fairness*:

Jordan Pearson. To Make AI Less Biased, Give It a Worldview. *Motherboard*, Sept. 27, 2016.

Related to *Certifying and removing disparate impact*:

Lauren J. Young. Computer Scientists Find Bias in Algorithms. *IEEE Spectrum*, August 21, 2015.

Julianne Pepitone. Can Resume-Reviewing Software Be As Biased As Human Hiring Managers? *NBC News*, August 17, 2015.

Kiona Smith-Strickland. Computer Programs Can Be as Biased as Humans. *Gizmodo*, August 16, 2015.

Background on Algorithmic Fairness:

Megan Rose Dickey. Algorithmic accountability: Algorithms are designed to make our lives easier. The problem is, they're designed by us. *TechCrunch*, Apr 30, 2017.

Stephanie Pappas. Bad News: Artificial Intelligence Is Racist, Too. *Live Science*, Apr 13, 2017.

Nidhi Subbaraman. Scientists Taught A Robot Language. It Immediately Turned Racist. *BuzzFeed News*, Apr 13, 2017.

Jeremy Hsu. AI Learns Gender and Racial Biases from Language. *IEEE Spectrum*, Apr 13, 2017.

Sam Levin. A beauty contest was judged by AI and the robots didn't like dark skin. *The Guardian*, September 8, 2016.

David Ingold and Spencer Soper. Amazon Doesn't Consider the Race of Its Customers. Should It? *Bloomberg*, April 21, 2016.

Rose Eveleth. The Inherent Bias of Facial Recognition. *Motherboard*, March 21, 2016.

Laura Sydell. Can Computer Programs be Racist and Sexist? *NPR*, March 15, 2016.

Lauren Kirchner. When big data becomes bad data. *ProPublica*, September 2, 2015.

Hal Hodson. No one in control: The algorithms that run our lives. *New Scientist*, February 4, 2015.

PUBLIC SERVICE
White House Office of Science and Technology Policy, July 2021 - December 2022

Research Advisory Council Member

Arnold Ventures' Advancing Pretrial Policy and Research, Fall 2020 - July 2021

First Judicial District of Pennsylvania (Philadelphia Courts), Fall 2019 - July 2021

PROFESSIONAL SERVICE
Co-Founder

Conference on Fairness, Accountability, and Transparency (FAccT)

Executive Committee Member
2018 – 2020 Conference on Fairness, Accountability, and Transparency (FAccT)

Program Committee Co-chair
2018 Conference on Fairness, Accountability, and Transparency (FAccT)
2015 and 2016 Workshops on Fairness, Accountability, and Transparency in Machine Learning

Guest Editor
Big Data, "Special Issue on Social and Technical Trade-Offs," 2017

Program Committee Area Chair
2023 Conference on Fairness, Accountability, and Transparency (*FAccT*)
2020 International Conference on Machine Learning (*ICML*)
2020 Black in AI Workshop

Program Committee Member
2021 International Conference on Machine Learning (*ICML*)
2020 Conference on Fairness, Accountability, and Transparency (*FAccT*)
2019, 2020 Conference on Neural Information Processing Systems (*NeurIPS*)
2017 – 2020 ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (*KDD*), Applied Data Science Track
2019, 2018 Black in AI Workshop
2019 *AAAI* Conference on Artificial Intelligence
2018, 2017 Workshop on Ethics in Natural Language Processing
2018 SIAM Algorithm Engineering and Experiments (*ALENEX*)
2017 International Conference on Information and Knowledge Management (*CIKM*)
2017 Workshop on Fairness, Accountability, and Transparency in Machine Learning (*FAT/ML*)
2017 Workshop on Technology and Consumer Protection (*ConPro*)
2017, 2016, 2015 SIAM International Conference on Data Mining (*SDM*)

Workshop Co-organizer
2021 AALAC Workshop on Data Science in the Liberal Arts
2017, 2016, 2015 Workshops on Fairness, Accountability, and Transparency in Machine Learning
2017 AALAC Workshop on Data Ethics

Committee Member
2017, 2016 CRA Outstanding Undergraduate Researchers Selection Committee
2015 ACM Student Research Competition poster judge at Grace Hopper

External Reviewer
2023 External Reviewer, University of Richmond Computer Science Department

Reviewer
2016 - 2021 NSF Panels
2019 Science Advances
2018 ACM Transactions on Computing Education
2017 Nature and Nature Communications
2017 CSCW
2014 ACM-SIAM Symposium on Discrete Algorithms
2011 Symposium on Computational Geometry
2008 Scandinavian Workshop on Algorithm Theory

HAVERFORD COLLEGE TEACHING AND SERVICE

Haverford College is a leading liberal arts college with a student body of 1,420 composed entirely of undergraduate students. The teaching load is 5 course units per year, with lab / discussion sections and senior thesis advising counting towards the total teaching load. The college operates under a philosophy of shared governance among the administration, faculty, students, and staff.

UNDERGRADUATE THESIS ADVISEES by graduation year

2023 Jade Rousseau, *Fairness in Information Access: Emphasizing the Network*
Xiaorong (Sharon) Wang, *Pre-training and Fine-tuning BERT: Energy and Carbon Considerations*

2022 Jiajie (Jason) Ma, *Information Access Representation of Social Networks: A Theoretical Analysis*
Nasanbayar Ulzii-Orshikh, *Community-based Fairness in Networks*

2021 Zachary Broadman, *Using Information Access to Characterize and Group Social Media Users*
Monique Byars, *Inclusivity and Transparency in Machine Learning Model Auditing*
Steve Lee, *Identity and Computer Science: A Mismatch?*
Ruiming (Ray) Li, *Quantifying Uncertainty in Shapley-value-based Explanations for Machine Learning Models*
Jason Ngo, *Understanding Machine Learning Models Through Shapley Values and the Associated Uncertainties*
Vincent Yu, *Recommender Systems for Scientific Explorations*

2020 Hannah Beilinson, *Fairness and Information Access Clustering in Social Networks*
Emile Givental, *Interpretable Meta Learning*
Kadan Lottick, *Energy Consumption in Machine Learning*
Charlie Marx, *Indirect Influence and Fairness in Machine Learning*
Gareth Nicholas, *Active Meta-Learning*
Silvia Susai, *Analyzing Energy Efficiency in Neural Networks*

2019 Yasmine Ayad, *Analyzing the COMPAS Algorithm in Criminal Defendant Risk Assessment*
Arthur Chang, *Intersectionality and Fairness in Machine Learning*
Yilin Li, *Adversarial Examples under Fairness Constraints*
Jai Nimgaonkar, *Re-evaluation of the ProPublica Article on Machine Bias*
Dylan Slack, *Expert-Assisted Transfer Reinforcement Learning*
Chris Villalta, *State Influence Calculations for Deep Q-Networks*

2018 Richard Phillips, *Explaining Neural Network Predictions with Image Certainty Translation*
Derek Roth, *A Comparison of Fairness-Aware Machine Learning Algorithms*

2017 Kyu Chang, *Explaining Active Learning Queries*
Evan Hamilton, *Benchmarking Fairness Aware Machine Learning*
Tionney Nix, *A Rule Learning Approach to Discovering Contexts of Discrimination*

2016 Casey Falk, *Auditing Deep Neural Networks and Other Black-box Models*
Jason Feinberg, *k-Robust Nearest Neighbor Search and Classification*
Brian Guggenheimer, *The Red Pen: Applying Computer Vision to Automate the Grading of Traditional Assignments*
Geoffrey Martin-Noble, *Optimizing a Machine Learning System for Materials Discovery*
Gabriel Rybeck, *Indirect Discrimination in the Age of Big Data*
Brandon Smith, *Auditing Deep Neural Networks to Understand Recidivism Prediction*

2015 Michael Feldman, *Computational Fairness: Preventing Machine-Learned Discrimination*
Aaron Lowe, *Persistence in Learning: Persistent Homology and its Application to Machine Learning*

2014   Paulina Cueto, *Identifying the Relationship Between Evolutionary Distance and the Accuracy of Cis-Regulatory Module Predictions*
Harry Levin, *Computerized Redistricting: Examining the Weighted Points Version of the Capacitated k-Center Problem*
Karl Moll, *Community Detection in Multidimensional Social Networks*
Paul Raccuglia, *Dark Reactions: Recommender Guided Materials Discovery*
Yingying (Daisy) Sheng (Bryn Mawr College), *A Practical Evaluation of Kinetic Data Structure on Android Devices*

UNDERGRADUATE RESEARCH STUDENTS

Class of 2025   Jadyn Elliot, Spring 2023
Class of 2024   Charlie Crawford, Summer 2021, Summer 2022
    Mia Ellis-Einhorn, Summer 2022
Class of 2023   Jade Rousseau, Summer 2021 - Spring 2023
    Sharon Wang, Summer 2020 - Spring 2023
Class of 2022   Calvin Barrett, Fall 2019 - Spring 2020
    Isaac Chang, Summer 2020 - Fall 2021
    William Lawrence, Summer 2019
    Joseph Kawamura, Summer 2021
    Iryna Khovryak, Fall 2020 - Fall 2021
    Jason Ma, Summer 2019 - Spring 2022
    Femi Obiwumi, Summer 2019 - Spring 2020
        Chesick scholar
    Nasanbayar Ulzii-Orshikh, Spring 2020 - Spring 2022
    Ziyao Wang, Summer 2020
Class of 2021   Eniola Ajao '21, Summer 2018 - Spring 2019
        Chesick scholar
    Haosong Huang, Summer 2020
    Steve Lee, Summer 2019, Summer 2020
    Ruiming (Ray) Li, Summer 2019 - Spring 2021
    Kaito Nakatani, Summer 2020
    Jason Ngo, Fall 2019 - Spring 2021
    Jan Estrada Pabón, Fall 2019 - Spring 2021
    Lizzie Spano, Summer 2020
    Vincent Yu, Summer 2020 - Spring 2021
    Ivy Zhang, Summer 2019
Class of 2020   Hannah Beilinson, Spring 2018 - Spring 2020
    Emile Givental, Spring 2018 - Spring 2020
    Kadan Lottick, Summer 2019 - Fall 2019
    Charles Marx, Summer 2017 - Spring 2020
        Beckman scholar and 2020 Runner-Up CRA Outstanding Undergrad. Researcher Award (1 of 9 chosen across N. America)
    Gareth Nicholas, Fall 2017 - Spring 2020
    Ben Rogers-Boehme, Summer 2018
    Matthew Scharf, Summer 2018
    Silvia Susai, Summer 2019 - Fall 2019
Class of 2019   Monique Byars, Summer 2016 - Summer 2017
    Yutong Li, Spring 2017 - Fall 2017
    Jai Nimgaonkar, Spring 2018 - Fall 2019
    Dylan Slack, Fall 2017 - Summer 2019
    Christopher Villalta, Summer 2018 - Spring 2019

Class of 2018	Tosin Alliyu, Summer 2015 - Spring 2017
	Skyler Ellenburg, Fall 2015 - Fall 2016
	Dylan Emery, Summer 2018
	Richard Phillips, Spring 2016 - Spring 2018
	Chesick and Beckman scholar
	2018 CRA Outstanding Undergrad. Researcher Award
	1 of 4 chosen across N. America
Class of 2017	Tionney Nix, Summer 2015 - Summer 2017
	Derek Roth, Fall 2015 - Fall 2017
	Nora Tien, Summer 2014 - Spring 2017
	Daniel Washburn, Summer 2015
Class of 2016	Casey Falk, Fall 2013 - Spring 2016
	Jason Feinberg, Fall 2014 - Spring 2016
	Arthur Emidio Teixeira Ferreira, Summer 2014
	Brian Guggenheimer, Summer 2014
	Geoffrey Martin-Noble, Spring 2015 - Spring 2016
	Goldwater scholar
	Joshua Serota, Summer 2014
Class of 2014	Paul Raccuglia, Fall 2012 - June 2014

COURSES DEVELOPED

CS 104 Topics in Introductory Programming

Topics in Introductory Programming is designed to give a general introduction to programming as related to data analysis across many fields. Students will be introduced to standard introductory programming imperative and object oriented techniques as well as data structures necessary to create efficient and understandable algorithmic solutions to problems. Data for analysis will be drawn from a single discipline that will vary per semester, forming a theme for topical study. Topical investigations will include the ethics of data use in that field, how data is commonly generated and used, and implementation of important discipline-specific algorithms.

CS 207 Data Science and Visualization

An introduction to techniques for the automated and human-assisted analysis of data sets. These "big data" techniques are applied to data sets from multiple disciplines and include cluster, network, and other analytical methods paired with appropriate visualizations.

CS 395 Mobile Development for Social Change

Mobile Development for Social Change will focus on standard software engineering principles, object oriented programming, event-driven and multi-threaded programming, Android-specific mobile development concepts, and designing a positive user experience in the context of a semester-long placement with a local non-profit.

COURSES TAUGHT

Haverford College

Independent Research is an independent study research course that does not include additional students doing research for senior thesis and does not count towards the total teaching load.

Spring 2023		Research leave
	CS 480	Independent Research (1 student)
Fall 2022 -		White House Office of Science and Technology Policy
Fall 2023		
Spring 2021	CS 399	Senior Thesis Seminar (lecture, 14 students)
	CS 480	Independent Research (2 students)

Fall 2020	CS 340	Analysis of Algorithms (lecture and lab, 24 students)
	CS 399	Senior Thesis Seminar (lecture, 33 students)
	CS 480	Independent Research (4 students)
Spring 2020	CS 399	Senior Thesis Seminar (lecture, 15 students)
	CS 480	Independent Research (7 students)
Fall 2019	CS 340	Analysis of Algorithms (lecture and lab, 39 students)
	CS 399	Senior Thesis Seminar (lecture, 30 students)
	CS 480	Independent Research (5 students)
Spring 2019	CS 106	Introduction to Data Structures (lecture, 30 students)
	CS 480	Independent Research (5 students)
Fall 2018		Partial research leave, senior thesis supervision, college service
	CS 480	Independent Research (6 students)
Spring 2018		Research leave, senior thesis supervision
	CS 480	Independent Research (6 students)
Fall 2017		Partial research leave, partial parental leave, senior thesis supervision
	CS 480	Independent Research (4 students)
Spring 2017	CS 104	Topics in Introductory Programming: Social Inquiry (lecture and lab, 25 students)
	CS 480	Independent Research (4 students)
Fall 2016	CS 340	Analysis of Algorithms (lecture and lab, 32 students)
	CS 480	Independent Research (5 students)
Spring 2016	CS 207	Data Science and Visualization (lecture and lab, 27 students)
	CS 480	Independent Research (4 students)
Fall 2015	CS 340	Analysis of Algorithms (lecture and lab, 26 students)
	CS 480	Independent Research (4 students)
Spring 2015	CS 395	Mobile Development for Social Change (lecture and lab, 21 students)
	CS 480	Independent Research (3 students)
Fall 2014	CS 340	Analysis of Algorithms (lecture and lab, 25 students)
	CS 480	Independent Research (3 students)
Spring 2014	CS 207	Data Science and Visualization (lecture and lab, 18 students)
	CS 480	Independent Research (2 students)
Fall 2013	CS 105	Introduction to Computer Science (2 sections and 1 lab, 72 students total)
	CS 480	Independent Research (2 students)
Spring 2013	CS 340	Analysis of Algorithms (lecture and lab, 32 students)
	CS 395	Mobile Development for Social Change (lecture and lab, 22 students)
	CS 480	Independent Research (1 student)
Fall 2012	CS 105	Introduction to Computer Science (co-taught with Dave Wonnacott, 78 students)
	CS 101	Fluency with Information Technology (25 students)
	CS 480	Independent Research (1 student)

University of Maryland, College Park

Summer 2009	CMSC 451	Design and Analysis of Computer Algorithms (10 students)
Summer 2007	CMSC 330	Organization of Programming Languages (39 students)
Spring 2006	CMSC 311	Computer Organization (TA, discussion section leader)
Fall 2005	CMSC 212	Introduction to Low-Level Programming Concepts (TA, discussion section leader)

Springside School, Philadelphia

Fall 2004 - Spring 2005	5th, 6th, 7th, and 8th Grade Mathematics

COLLEGE SERVICE
Appointed Service

Faculty Affairs and Planning Committee (elected)	Fall 2020 - Spring 2021
— EPC restructuring into ECC and SCPC	
— Fall 2020 strike resolution support	
— Faculty salary study and systematized comparison structure	
— Additional faculty governance issues	
Haverford Innovation Program Advisory Committee	Fall 2018 - Spring 2020
Hurford Center for the Arts and Humanities Steering Committee	Fall 2019 - Spring 2020
CRAFT Advisory Committee	Fall 2019 - Spring 2020
Computer Science Search Committee	Fall 2018 - Spring 2019
Haverford Innovation Program Staff Search Committee, chair	Fall 2016
Computational Studies Working Group, member	Fall 2016 - Spring 2017
Panel for Cases of Sexual and Racial Harassment, Faculty representative	Fall 2016 - Spring 2017
Visual Studies Search Committee, member	Fall 2015 - Spring 2016
Visual Studies Working Group, member	Fall 2014 - Spring 2015

Departmental Service

Departmental Diversity Coordinator	Fall 2020 - present
Computer Science Departmental Search Committee	Spring 2015, 2017, 2019

Advising   Fall 2014 - present

class of '24: 2 pre-major advisees
class of '23: 4 pre-major advisees
class of '22: 3 pre-major advisees, 9 majors
class of '21: 11 major advisees
class of '20: 5 pre-major advisees, 8 majors
class of '19: 5 pre-major advisees, 6 majors
class of '18: 6 majors, 3 minors
class of '17: 3 majors
class of '16: 9 majors, 3 minors

Other Service / Activities

STEM Forum / HHMI CS departmental representative	Spring 2019 - present
Tech & Justice speakers series co-organizer	Spring 2019 - Spring 2020
Beckman Scholars Selection Committee	Spring 2015, 2019
Innovation Incubator, informal working group member	Spring 2015 - Spring 2016
Computational Studies, informal working group member	Fall 2015 - Spring 2016
MakerArts space discussions within VCAM	Fall 2015 - Spring 2016
Haverford Women in STEM panel participant	Spring 2016
Physics faculty search participant	Spring 2016
Digital scholarship librarian search participant	Spring 2016
Critical Making Faculty Seminar, co-organizer	Spring 2015
http://tdh.brynmawr.edu/criticalmaking/	
Tri-Co Hackathon, co-organizer	Spring 2014, Spring 2015
Haverford OutWeek, panel participant	Fall 2013, Fall 2014