

Berk Ustun

CURRICULUM VITAE — MARCH 2024

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ACADEMIC POSITIONS	University of California, San Diego Assistant Professor, Halıcıoğlu Data Science Institute Affiliate Faculty, Department of Computer Science & Engineering	2021 – PRESENT
	Google AI Visiting Faculty, Responsible AI and Human-Centered Technology	2020 – 2021
	Harvard University Postdoctoral Fellow, Center for Research on Computation & Society	2017 – 2020
RESEARCH INTERESTS	Areas: Machine Learning, Optimization, Human-Centered Design Topics: Fairness, Interpretability, Safety, Personalization, Governance Domains: Medicine, Consumer Finance, Criminal Justice, Physical Sciences	
EDUCATION	Massachusetts Institute of Technology Ph.D. in Electrical Engineering & Computer Science Thesis: Simple Linear Classifiers via Discrete Optimization	2012 – 2017
	S.M. in Computation for Design & Optimization Thesis: MCMC for Importance Sampling in Stochastic Programming	2010 – 2012
	University of California, Berkeley B.S. in Industrial Engineering & Operations Research, B.A. in Economics	2005 – 2009
SELECTED AWARDS & HONORS	National Academy of Sciences – Kavli Fellow INFORMS Innovative Applications in Analytics Award Invenia Labs Social Environmental & Economic Challenges Award – Finalist INFORMS Computing Society Best Student Paper Prize INFORMS Wagner Award for Excellence in Operations Research Practice – Finalist INFORMS Innovative Applications in Analytics Award MIT Presidential Fellowship	2022 2019 2018 2017 2017 2016 2012
PUBLICATIONS	MACHINE LEARNING METHODS	
Google Scholar	1. Prediction without Preclusion: Recourse Verification with Reachable Sets Avni Kothari*, Bogdan Kulynych*, Lily Weng, Berk Ustun	
GitHub	ICLR – <i>International Conference on Learning Representations</i> , 2024 Spotlight Paper at ICLR 2024	
* Equal Contribution	2. Classification with Conceptual Safeguards Hailey Joren, Charles T. Marx, Berk Ustun	
$\alpha\beta$ Alphabetical	ICLR – <i>International Conference on Learning Representations</i> , 2024	
	3. Operationalizing the Search for Less Discriminatory Alternatives in Fair Lending Talia Gillis, Vitaly Mersault, Berk Ustun FAccT – <i>ACM Conference on Fairness, Accountability, and Transparency</i> , 2024	
	4. Participatory Personalization in Classification Hailey Joren, Chirag Nagpal, Katherine Heller, Berk Ustun NeurIPS – <i>Neural Information Processing Systems</i> , 2023 Spotlight Paper at NeurIPS 2023	

5. [When Personalization Harms Performance: Reconsidering the Use of Group Attributes in Prediction](#)
 Vinith Suriyakumar, Marzyeh Ghassemi*, Berk Ustun*
ICML – International Conference on Machine Learning, 2023
Oral Presentation at ICML 2023
6. [Predictive Multiplicity in Probabilistic Classification](#)
 Jamelle Watson-Daniels, David Parkes, Berk Ustun
AAAI – Association for the Advancement of Artificial Intelligence, 2023
Oral Presentation at AAAI 2023
7. [Providing Fair Recourse over Plausible Groups](#)
 Jayanth Yetukuri, Ian Hardy, Yevgeniy Vorobeychik, Berk Ustun, Yang Liu
AAAI – Association for the Advancement of Artificial Intelligence, 2024
Oral Presentation at AAAI 2024
8. [Algorithmic Censoring in Dynamic Learning Systems](#)
 Jennifer Chien, Margaret Roberts, Berk Ustun
EAAMO – ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization, 2023
9. [On the Epistemic Limits of Personalized Prediction](#)
 Lucas Monteiro*, Carol Long*, Berk Ustun, Flavio du Pin Calmon
NeurIPS – Neural Information Processing Systems, 2022
10. [Rank List Sensitivity of Recommender Systems to Interaction Perturbations](#)
 Sejoon Oh, Berk Ustun, Julian McAuley, Srijan Kumar
CIKM – Conference on Information and Knowledge Management, 2022
11. [Learning Optimal Predictive Checklists](#)
 Haoran Zhang, Quaid Morris, Berk Ustun*, Marzyeh Ghassemi*
NeurIPS – Neural Information Processing Systems, 2021
12. [Predictive Multiplicity in Classification](#)
 Charles T. Marx, Flavio du Pin Calmon, Berk Ustun
ICML – International Conference on Machine Learning, 2020
13. [Learning Optimized Risk Scores](#)
 Berk Ustun, Cynthia Rudin
JMLR – Journal of Machine Learning Research, 2019
Winner of the 2017 INFORMS Computing Society Best Student Paper Prize
Part of Winning Entry for the 2019 INFORMS Innovative Applications in Analytics Award
14. [Actionable Recourse in Linear Classification](#)
 Berk Ustun, Alexander Spangher, Yang Liu
FAccT – ACM Conference on Fairness, Accountability, and Transparency, 2019
Featured in Wired
15. [Fairness without Harm: Decoupled Classifiers with Preference Guarantees](#)
 Berk Ustun, Yang Liu, David C. Parkes
ICML – International Conference on Machine Learning, 2019
16. [Repairing without Retraining: Avoiding Disparate Impact with Counterfactual Distributions](#)
 Hao Wang, Berk Ustun, Flavio du Pin Calmon
ICML – International Conference on Machine Learning, 2019

17. [On the Direction of Discrimination: an Information-Theoretic Analysis of Disparate Impact](#)
Hao Wang, Berk Ustun, Flavio du Pin Calmon
ISIT – IEEE International Symposium on Information Theory, 2018
 18. [Optimized Risk Scores](#)
Berk Ustun, Cynthia Rudin
KDD – ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2017
Winner of the 2017 INFORMS Computing Society Best Student Paper Prize
 19. [Supersparse Linear Integer Models for Optimized Medical Scoring Systems](#)
Berk Ustun, Cynthia Rudin
MLJ – Machine Learning, 2015
Part of Winning Entry for the 2016 INFORMS Innovative Applications in Analytics Award
 20. [Importance Sampling in Stochastic Programming: A Markov Chain Monte Carlo Approach](#)
Panos Parpas, Berk Ustun, Mort Webster, Quan Kha Tran
INFORMS Journal of Computing, 2015
- MACHINE LEARNING APPLICATIONS
21. [Optimized Risk Score to Predict Mortality in Patients with Cardiogenic Shock in the Cardiac ICU](#)
Eric Yamga, Sreekar Mantena, Darin Rosen, Emily Bucholz, Robert Yeh, Leo Celi, Berk Ustun, Neel Butala
Journal of the American Heart Association, 2023
 22. [Optimized Short-Forms of the Cognitive Distortions Questionnaire](#)
Amanda S. Morrison, Berk Ustun, Arielle Horenstein, Simona Kaplan, Irismar Reis de Oliveira, Sedat Batmaz, James J. Gross, Ekaterina Sadikova, Curt Hemanny, Pedro Pires, Philippe Goldin, Ronald C. Kessler, Richard G. Heimberg
Journal of Anxiety Disorders, 2022
 23. [Development & Validation of a Model to Predict PTSD and Major Depression 3 Months after a Collision](#)
Hannah Ziobrowski, Chris Kennedy, Berk Ustun, & 55 Other Authors
JAMA Psychiatry, 2021
 24. [Developing an Optimal Short-Form of the PTSD Checklist for DSM-5](#)
Kelly Zuromski, Berk Ustun, Irving Hwang, Terry Keane, Brian Marx, Murray Stein, Robert Ursano, Ronald C. Kessler
Depression and Anxiety, 2019
 25. [Optimized Scoring Systems: Towards Trust in ML for Healthcare and Criminal Justice](#)
Cynthia Rudin, Berk Ustun
Interfaces, 2018
Finalist for 2018 INFORMS Wagner Award for Excellence in Operations Research Practice
 26. [Association of an EEG-Based Risk Score With Seizure Probability in Hospitalized Patients](#)
Aaron Struck, Berk Ustun, Andres Rodriguez Ruiz, Jong Woo Lee, Suzette LaRoche, Lawrence Hirsch, Emily Gilmore, Jan Vlachy, Hiba Arif Haider, Cynthia Rudin, Brandon Westover
JAMA Neurology, 2017
Part of Winning Entry for the 2019 INFORMS Innovative Applications in Analytics Award
 27. [The World Health Organization Adult ADHD Self-Report Screening Scale for DSM-5](#)
Berk Ustun, Lenard Adler, Cynthia Rudin, Stephen Faraone, Thomas Spencer, Patricia Berglund, Michael Gruber, Ronald C. Kessler
JAMA Psychiatry, 2017
Featured in NPR
 28. [Interpretable Classification Models for Recidivism Prediction](#)
Jiaming Zeng*, Berk Ustun*, Cynthia Rudin
Journal of the Royal Statistical Society: Series A, 2016
Winner of the ASA Undergraduate Statistics Research Project Competition

29. [Clinical Prediction Models for Sleep Apnea: Superiority of Medical History over Symptoms](#)
Berk Ustun, Brandon Westover, Cynthia Rudin, Matt Bianchi
Journal of Clinical Sleep Medicine, 2016
- PREPRINTS 30. [FINEST: Stabilizing Recommendations by Rank-Preserving Fine-Tuning](#)
Sejoon Oh, Berk Ustun, Julian McAuley, Srijan Kumar
In Submission, 2024
31. [Learning with Temporal Label Noise](#)
Sujay Nagaraj, Walter Gerych, Sana Tonekaboni, Anna Goldenberg, Berk Ustun, Thomas Hartvigsen
In Submission, 2024
32. [Predictive Churn with the Set of Good Models](#)
Jamelle Watson-Daniels, Flavio du Pin Calmon, Alexander D'Amour, Carol Long, David C. Parkes, Berk Ustun
In Submission, 2024
- REFEREED 33. [Learning to Lend in Dynamic, Resource-Constrained Environments](#)
WORKSHOP Eric Mibuari, David Parkes, Berk Ustun
PAPERS *ICLR Working on Practical ML for Developing Countries Workshop*, 2023
34. [Actionable Recourse in Linear Classification](#)
Alexander Spangher, Berk Ustun
FAT/ML Workshop, 2018
35. [Supersparse Linear Integer Models for Predictive Scoring Systems](#)
Berk Ustun, Stefano Tracà, Cynthia Rudin
AAAI Late Breaking Track, 2013
- ADVISING & MENTORING
- PHD STUDENTS
- | | |
|--------------------------------------|----------------|
| Shreyas Kadekodi, UCSD CSE | 2023 – PRESENT |
| Julian Skirzynski, UCSD CSE | 2022 – PRESENT |
| Hailey Joren, UCSD CSE | 2021 – PRESENT |
| Jamelle Watson-Daniels, Harvard SEAS | 2020 – PRESENT |
| Hao Wang, Harvard SEAS | 2017 – 2020 |
- MS STUDENTS
- | | |
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| Harry Cheon, UCSD CSE | 2024 – PRESENT |
| Avni Kothari, UCSD CSE | 2022 – 2023 |
| Vinith Suriyakumar, University of Toronto | 2020 – 2022 |
| Haoran Zhang, University of Toronto | 2020 – 2021 |
| Alexander Spangher, Columbia University | 2017 – 2019 |
- UNDERGRADUATES
- | | |
|------------------------------------|----------------|
| Tynan Seltzer, Harvard SEAS | 2018 – PRESENT |
| Charles T. Marx, Haverford College | SUMMER 2019 |
| Jiaming Zeng, MIT | 2014 – 2016 |
- GRANTS
- AS PRINCIPLE INVESTIGATOR
- | | |
|--|-------------|
| NSF CISE Core Program | 2023 – 2026 |
| RI: Foundations of Recourse Verification in Machine Learning
Co-PIs: Berk Ustun, Lily Weng. | |

NSF Program on Fairness in Artificial Intelligence 2021 – 2024
 FAI: Foundations of Fair AI in Medicine: Ensuring the Fairness of Patient Attributes
 Co-PIs: Flavio du Pin Calmon, Elena Glassman, Berk Ustun.

Amazon Research Award 2023 – 2024
 Participatory Personalization for Machine Learning
 PI: Berk Ustun.

AS INVESTIGATOR OR SENIOR PERSONNEL

NIH / NHGRI Bridge to Artificial Intelligence 2022 – 2026
 A FAIR Bridge2AI Center – Fabric
 Co-Investigator – Ethics Core.

NSF Convergence Accelerator – Track D 2021 – 2023
 AI & Community-Driven Wildland Fire Innovation via WIFIRE Commons
 Senior Personnel.

TEACHING DSC190/291 – Machine Learning Competitions SP24
 DSC291 – Interpretability & Explainability in Machine Learning WI22, FA22, FA23, SP24
 DSC140A – Probabilistic Modeling & Machine Learning SP22, SP23
 DSC180B – Data Science Capstone WI22, WI23, WI24
 DSC180A – Data Science Capstone FA21, FA22, FA23

INVITED TALKS Information Theory and Applications Workshop 2024
 Stanford University Statistics Seminar 2023
 Mathematical Sciences Research Institute 2023
 UCSD Institute for Practical Ethics Seminar Series 2023
 UCSF Bakar Computational Health Sciences Institute 2023
 École Polytechnique Fédérale de Lausanne 2023
 U.S. General Services Administration 2023
 Information Theory and Applications Workshop 2023
 NIH Bridge2AI - AI-READI Group 2023
 Conference on the Mathematical Theory of Deep Neural Networks – **Keynote** 2022
 Kavli Frontiers of Science Symposium 2022
 ICML Workshop on Algorithmic Recourse – **Keynote** 2021
 NeurIPS Workshop on Fair AI in Financial Services 2020
 ICML Workshop on Participatory Approaches in ML 2020
 Google AI 2020
 Brown University CS Colloquium 2020
 University of Washington CS Colloquium 2020
 University of Maryland CS Colloquium 2020
 University of Chicago CS Colloquium 2020
 University of British Columbia CS Colloquium 2020
 Northeastern University CS Colloquium 2020
 University of Toronto Mechanical and Industrial Engineering Seminar 2020
 UCSD Halicioğlu Data Science Institute 2020
 Tufts University CS Colloquium 2020
 Yale University CS Colloquium 2020
 Georgetown CS Colloquium 2020
 Duke AI+Health Seminar Series 2020
 INFORMS Annual Meeting 2019

CCC Workshop on Economics and Fairness	2019
Harvard Economics & Computation Seminar Series	2019
ACM Conference on Fairness, Accountability, and Transparency	2019
NeurIPS Workshop on Human-Centric ML	2019
Data & Society Meeting on Fair ML in Health	2019
10th Workshop on Decisions, Games, and Logic	2019
MIT Lincoln Labs AI Seminar Series	2019
Analysis Consulting Group, Data Science Seminar Series	2019
Harvard Data Science Conference	2018
Cornell University ORIE Department	2018
Harvard CRCS Colloquium	2018
INFORMS Annual Meeting	2017
Data & Society Research Institute	2017
INFORMS Annual Meeting	2016
UPENN Criminology Colloquium	2016
American Society of Criminology Annual Meeting	2015
ASA Conference on Statistical Learning and Data Mining	2014
MIT Big Data Initiative	2014
INFORMS Annual Meeting	2014
AAAI Conference on Artificial Intelligence	2013
8th Conference on Computational Management Science	2010

ACADEMIC
SERVICE

CONFERENCE & WORKSHOP ORGANIZATION

Executive Committee – ACM Conference on Fairness, Accountability and Transparency	2024 – PRESENT
Program Chair – ACM Conference on Fairness, Accountability and Transparency	2023
Workshop Organizer – MSRI Workshop on Randomization, Fairness, and Neutrality	2023
Workshop Organizer – FAT/ML	2017, 2018

ADVISORY BOARDS

Steering Committee – ACM Conference on Fairness, Accountability and Transparency	2023 – 2024
AlgoSoc Advisory Board – Dutch Ministry of Education, Culture and Science	2022 – PRESENT

GRANT REVIEWING

National Science Foundation Panelist	2019, 2023
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JOURNAL REVIEWING

Journal of Machine Learning Research, Management Science, IEEE Transactions on Signal Processing, Statistical Analysis & Data Mining, Artificial Intelligence, Information Sciences, Minds & Machines, Big Data, Epidemiology, Nature Digital Medicine, Artificial Intelligence & Law, Journal of Quantitative Criminology.

CONFERENCE AREA CHAIR

NeurIPS – Neural Information Processing Systems	2023
ICLR – International Conference on Learning Representations	2023
FACCT – ACM Conference on Fairness, Accountability and Transparency	2020, 2022

CONFERENCE REVIEWING

NeurIPS – Neural Information Processing Systems	2018–2022
NeurIPS – Ethics Reviewer	2021–2023
ICML – International Conference on Machine Learning	2019, 2022
ICLR – International Conference on Learning Representations	2020–2021
FACCT – ACM Conference on Fairness, Accountability and Transparency	2018–2021
AISTATS – Artificial Intelligence and Statistics	2019
AAAI – Association for the Advancement of Artificial Intelligence	2019

HCOMP – AAAI Conference on Human Computation and Crowdsourcing 2019
 UAI – Conference on Uncertainty in Artificial Intelligence 2018
 ISIT – IEEE International Symposium on Information Theory 2018

WORKSHOP REVIEWING

ICML Workshop for Human Interpretability in ML 2017, 2020
 NeurIPS Workshop on Fair ML for Healthcare 2019
 NeurIPS Workshop on Human Centered Machine Learning 2019
 CRAFT – Critiquing and Rethinking Accountability, Fairness, and Transparency 2019
 SafeML – ICML Workshop on Safe Machine Learning 2019
 DebugML – ICLR Workshop on Debugging Machine Learning Models 2019
 FAT/ML – Fairness, Accountability, and Transparency in ML 2017, 2018
 NeurIPS Machine Learning for Healthcare Workshop 2017, 2018

SELECTED
 PROFESSIONAL
 EXPERIENCE

Petal Technologies. New York, NY 2015 – PRESENT
Co-Founder & Technical Advisor
 Spearheaded machine learning strategy to lend responsibly to consumers without credit history in the US.
[Petal](#) is a fintech startup with over 100 employees and 300K customers.

Massachusetts General Hospital. Boston, MA 2014 – 2020
Departments of Neurology, MGH Lab of Computer Science, MGH Sleep Laboratory
 Built customized machine learning models to (i) predict seizure risk for patients in the ICU, (ii) predict the risk of hospital readmissions, and (iii) screen obstructive sleep apnea using electronic medical records.

Amazon. Seattle, WA SUMMER 2013
Research Scientist Intern, IPC Buying Strategy Team
 Developed algorithms to identify complementary products sold on Amazon.com. Proposed new inventory and transportation policies for complementary products that achieved major cost savings.

SELECTED
 PRESS &
 EDITORIALS

[What does a fair algorithm actually look like?](#)

Wired, October 2018.

[Big data vs. the credit gap](#)

Politico, February 2018.

[Just Data. How algorithms go bad – and how they can be saved.](#)

Colloquy, August 2018.

[Do You Zone Out? Procrastinate? Might Be Adult ADHD](#)

National Public Radio, April 2017.

[Good News for Screening for Adult ADHD](#)

Invited Commentary in JAMA Psychiatry, April 2017.

[A Novel Clinical Score to Assess Seizure Risk](#)

Invited Commentary in JAMA Neurology, October 2017.

[Big-Data or Slim-Data: Predictive Analytics Will Rule with World](#)

Editorial in Journal of Clinical Sleep Medicine, February 2016.

PERSONAL

Languages: Fluent in English, French and Turkish

Interests: Basketball, Hiking, Cooking, Photography, RPGs, Hard Science Fiction