Emily Aiken

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Research Interests

Intersection of machine learning and development economics, with a focus on leveraging large-scale digital traces for evidence-based social protection policy

Education

University of California, Berkeley, 2019-present
Ph.D. candidate, School of Information
M.S. candidate, Computer Science Department
Research advisor: Joshua Blumenstock
Thesis committee: Joshua Blumenstock (chair), Jennifer Chayes, Hany Farid, Solomon Hsiang, Edward Miguel
Research on using mobile phone metadata and satellite imagery for evidence-based development policy, including targeting aid, measuring mobility, and high-frequency estimation of vulnerability

Harvard University, 2015-2019
A.B. with high honors in Computer Science, magna cum laude
Secondary field in Global Health
Honors thesis advisor: Mauricio Santillana
Research with Boston Children's Hospital Computational Health Informatics Program on machine learning methods using Internet-based data sources for outbreak tracking and forecasting

Awards

Rising Star in Data Science (by University of Chicago and UC San Diego), 2023
Microsoft Research PhD Fellowship, 2022-2024
Berkeley School of Information Outstanding Graduate Student Instructor Award, 2023
Berkeley AI Research Ignition Award, 2022-2023
Best Paper Award, ACM COMPASS, 2022

Journal Articles and Conference Proceedings

Emily Aiken*, Esther Rolf*, and Joshua Blumenstock (2023). Fairness and representation in satellite-based poverty maps: Evidence of urban-rural disparities and their impacts on downstream policy. *IJCAI* [paper, code].

Emily Aiken, Suzanne Bellue, Dean Karlan, Chris Udry, and Joshua Blumenstock (2022). Machine learning and phone data can improve targeting of humanitarian aid. *Nature* Vol. 603, No. 7903 [paper, code, talk].
★ Selected for cover of the March 29, 2022 print edition of *Nature*

Emily Aiken*, Viraj Thakur*, and Joshua Blumenstock (2022). Phone sharing and cash transfers in Togo: Quantitative evidence from mobile phone data. *ACM COMPASS* [paper, code].
★ Best paper award

Emily Aiken, Guadalupe Bedoya, Aidan Coville, and Joshua Blumenstock (2022). Targeting development aid with machine learning and mobile phone data: Evidence from an anti-poverty intervention in Afghanistan. *Journal of Development Economics* Vol. 161 [paper, extended abstract, code, talk].

Emily Aiken, Andre Nguyen, Cecile Viboud, and Mauricio Santillana (2021). Towards the use of neural networks for influenza prediction at multiple spatial resolutions. *Science Advances* Vol. 7, eabb1237 [paper, extended abstract, code].

Emily Aiken, Sarah McGough, Maiamuna Majumder, Gal Wachtel, Andre Nguyen, Cecile Viboud, and Mauricio Santillana (2020). Real-time estimation of disease activity in emerging outbreaks using internet search information. *PLOS Computational Biology* Vol. 16, e1008117 [paper, code].

Working Papers and Preprints

Emily Aiken, Suzanne Bellue, Dean Karlan, Chris Udry, and Joshua Blumenstock (2023). Estimating impact with surveys versus digital traces: Evidence from randomized cash transfers in Togo. *NBER Working Paper No. 31751.* [paper].

Emily Aiken, Tim Ohlenburg, and Joshua Blumenstock (2023). Moving targetings: The role of model and data recency in proxy means test accuracy. *Working Paper.* [paper, extended abstract].

Nitin Kohli*, **Emily Aiken***, and Joshua Blumenstock (2020). Privacy guarantees for personal mobility data in humanitarian response. *arXiv preprint* [paper].

Workshop and Short Papers

Satej Soman, **Emily Aiken**, Esther Rolf, and Joshua Blumenstock (2023). Can strategic data collection improve the performance of poverty prediction models? *ICLR Workshop on Practical Machine Learning for Development* [paper].

Rachel Warren, **Emily Aiken,** and Joshua Blumenstock (2022). Home location detection from mobile phone data: Evidence from Togo. *ACM COMPASS (Poster Track)* [paper].

Teaching

INFO288: Big Data and Development (spring 2024)
Co-instructor of graduate seminar for 30 students from information, data science, and public policy. Co-designed syllabus, taught lectures and labs, and designed assignments.

INFO251: Applied Machine Learning (spring 2022)
Head teaching assistant for a class of 100 graduate students. Taught sections, designed problem sets, and managed two other teaching assistants. Received the School of Information outstanding graduate student instructor award.

Tutorials
Tutorial on satellite-based poverty mapping (MeasureDev 2022)
Tutorial on effective, deployed, and thoughtful AI for social impact (EAAMO 2023)

Undergraduate Mentoring
Adrian Dar Serapio (fall 2021 - spring 2022)
Connor Manuel (fall 2022 - spring 2023)
Viraj Thakur (spring 2022 - fall 2023)

Other Research and Work Experience

Oxford Policy Management (consultant, fall 2022 - spring 2023)
Coathour of a GIZ guidance tool for country readiness for employing digital data sources in social protection, and co-organized a session on digital data at the GIZ/World Bank Global Forum on Adaptive Social Protection.

GIZ: German Agency for International Cooperation (consultant, fall 2021)
Coauthor of a GIZ report on digital data in social protection. Conducted interviews with stakeholders in social protection and data science sectors in industry and academia and crafted a report and recommendations.

GiveDirectly (consultant, summer 2021)
Consultant in uses of big data (satellite imagery and mobile phone data) for targeting emergency cash transfers. Developed open source python package "cider" for targeting aid with machine learning, mobile phone data, and satellite imagery, provided guidelines for software use and guidance to ethical review committee on big data targeting, performed ad hoc data science analysis and helped train new GiveDirectly data science employees.

École Polytechnique Fédérale de Lausanne (EPFL) (research intern, summer 2018)
Intern in Karl Aberer's Distributed Information Systems Laboratory working on applying facial similarity algorithms for identifying missing people in social media streams.

InSTEDD (intern, summer 2016; consultant, 2016-2019)
Long-term consultant focused on technical and non-technical aspects of several ICTD (Information & Communication Technologies for Development) projects; focused mainly on data and analytics platforms for open-source tools for health and social protection.

Invited Talks

2023: POMS-HK Conference (Hong Kong Polytechnic University), Stanford, Cornell Tech, Georgetown, Center for Health Policy and Research (UC Davis), World Bank/GIZ Global Forum on Adaptive Social Protection, Harvard Workshop on the Future of AI and Economics, ETH Zurich, New Directions in the Fight Against Poverty Conference: Honoring Martin Ravallion's Legacy, CMU Africa, NeurIPS Workshop on Computational Sustainability

2022: World Bank Measuring Development Conference, MIT Media Lab, Conference on Digital Experimentation @ MIT, CMU Africa, Harvard Center for Research on Computation and Society, Georgetown

2021: Good Tech Fest, IPA Methods and Measurement Conference, What Works Global Summit, CEGA Evidence to Action, Microsoft Research PhD Fellowship Research Showcase, NeurIPS Workshop on AI For Humanitarian Action and Disaster Response

2020: UC Davis Big Data for Agriculture Conference, Harvard Center for Research on Computation and Society (CRCS) Workshop on AI for Social Good, Pacific Conference on Development Economics, World Bank Measuring Development Conference, Mechanism Design for Social Good (MD4SG)

2019: African Union Workshop on Big Data for Disease Surveillance, NeurIPS workshop on machine learning for health (ML4H)

Professional Service

Program Committee Membership
ACM FAccT (2024)
IJCAI Workshop on Fair Division (2023)
ICLR Workshop on Practical ML for Developing Countries (2023)
ACM EAAMO Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (2022)
ACM SIGCAS COMPASS Conference on Computing and Sustainable Societies (2022)
KDD Workshop on Humanitarian Mapping (2021)
IJCAI Workshop on AI for Social Good (2020)
Harvard CRCS Workshop on AI for Social Good (2020)

Journal Reviewing
Communications of the ACM
Data and Policy
Journal of Development Engineering
Journal of Development Economics
Journal of Economic Inequality

National Science Foundation
World Bank Economic Review

Selected Press Coverage

R. Leven (2022). “Mobile phone data and machine learning helped Togo government provide assistance.” *Berkeley CDSS News* [link].
E. Aiken and J. Blumenstock (2022). “How AI helped deliver cash to many of the poorest people in Togo.” *The Conversation* [link].
H. Gelbart (2021). “Using satellite photos to help distribute cash.” *BBC* [link].
M. Gharib (2021). “The pandemic pushed this farmer into deep poverty. Then something amazing happened.” *NPR* [link].
S. Elks (2020). “Charity uses mobile phone data to identify aid recipients in Togo.” *Reuters* [link].
T. Simonite (2020). “A clever strategy to distribute Covid aid -- with satellite data.” *Wired* [link].
T. Visram (2020). “How GiveDirectly is finding the poorest people in the world -- and sending them cash.” *FastCompany* [link].
Unknown (April 2021). “In poor countries, statistics are both undersupplied and underused.” *The Economist* [link].