

# Joshua Evan Blumenstock

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## Professional Position

- Associate Professor, University of California, Berkeley, 2020 - *present*  
Faculty Co-Director, Center for Effective Global Action  
Director, Data-Intensive Development Lab

## Education

- **University of California, Berkeley**, Berkeley, CA  
Ph.D., School of Information, 2012  
M.A., Economics, 2010
- **Wesleyan University**, Middletown, CT  
B.A., Computer Science, 2003 (high honors)  
B.A., Physics, 2003 (high honors)

## Affiliations

- Affiliate, Bureau for Research and Economic Analysis of Development (BREAD)
- Affiliate, Jameel Poverty Action Lab (J-PAL)
- Research Affiliate, Center for Economic Policy Research (London, England)
- Research Fellow, Institute for the Study of Labor (IZA, Germany)
- Senior Fellow and Faculty Council Member, Berkeley Institute for Data Science (U.C. Berkeley)
- Faculty Affiliate, Opportunity Lab (U.C. Berkeley)

## Past Positions

2016-2019 *Assistant Professor*, University of California, Berkeley  
2013-2016 *Assistant Professor*, University of Washington, Information School  
2013-2016 *Adjunct Assistant Professor*, University of Washington, Computer Science and Engineering  
2013-2016 *Founder and co-Director*, University of Washington, Data Science and Analytics Laboratory  
2012 *Post-Doctoral Fellow*, Yale University, Department of Economics  
2005-2006 *Founding Engineer*, HOTorNOT.com  
2003-2004 *Fellow*, Thomas J. Watson Foundation  
2002 *Intern*, Microsoft Research  
2001 *Research Associate*, Harvard Institutes of Medicine

## Honors and Awards

2020	<i>Faculty Early Career Award (CAREER)</i> , National Science Foundation
2019	<i>Chancellor's Award for Research in the Public Interest</i> , U.C. Berkeley
2019	<i>Best Article in Economic Sociology (Honorable Mention)</i> , American Sociological Association
2019	<i>Machine Learning Research Award</i> , Amazon
2018	<i>Hellman Fellowship</i> , Hellman Foundation
2017	<i>Okawa Prize</i> , Okawa Foundation
2017	<i>Wireless Innovation Prize (Finalist)</i> , Vodafone Foundation
2015	<i>Millennium Grand Challenge Award</i> , Bill and Melinda Gates Foundation
2014	<i>Faculty Research Award</i> , Google
2013	<i>Early Career Faculty Award</i> , Intel
2013	<i>Community Award</i> , USENIX Networked Systems Design and Implementation
2012	<i>O.S. Braunstein Prize (Best Student Paper)</i> , Pacific Telecommunications Council
2007-2011	<i>Berkeley Fellowship</i> , University of California at Berkeley
2003-2004	<i>Watson Fellowship</i> , Thomas J. Watson Foundation
2003	<i>Phi Beta Kappa</i> , Wesleyan University
2003	<i>Senior Prize in Computer Science</i> , Wesleyan University
2000	<i>Johnston Prize in Physics</i> , Wesleyan University

## Publications

### Journal Articles

- Blumenstock, J.E. (2020). Machine learning can help get COVID-19 aid to those who need it most. *Nature*, 581(7807). doi: [10.1038/d41586-020-01393-7](https://doi.org/10.1038/d41586-020-01393-7)
- Chi, G., Chi, G., Lin, F., Blumenstock, J.E. (2020). A General Approach to Detecting Migration Events in Digital Trace Data. *PLoS ONE*, 15(10). doi: [10.1371/journal.pone.0239408](https://doi.org/10.1371/journal.pone.0239408)
- Blumenstock, J.E., Ghani, T., and Callen, M. (2018). Why Do Defaults Affect Behavior? Experimental Evidence from Afghanistan. *American Economic Review*, 108(10), 2868-2901. doi: [10.1257/aer.20171676](https://doi.org/10.1257/aer.20171676)
- Park, P., Blumenstock, J.E., and Macy, M. (2018). The strength of long-range ties in population-scale social networks. *Science*, 362(6421), 1410-1413. doi: [10.1126/science.aau9735](https://doi.org/10.1126/science.aau9735)
- Blumenstock, J.E. (2018). Don't forget people in the use of big data for development. *Nature*, 561(7722), 170-172. doi: [10.1038/d41586-018-06215-5](https://doi.org/10.1038/d41586-018-06215-5)
- Blumenstock, J.E. (2018). Estimating Economic Characteristics with Phone Data. *American Economic Review: Papers and Proceedings*, 108, 72-76. doi: [10.1257/pandp.20181033](https://doi.org/10.1257/pandp.20181033)
- Steele, J.E., Sundsoy, C., Pezzulo, C., Alegana, V., Bird, T., Blumenstock, J.E., Bjelland, J., Engo-Monsen, K., de Montjoye, Y.A., Iqbal, A., Hadiuzzaman, K., Wetter, E., Tatem, A.J., and Bengtsson, L. (2017). Mapping poverty using mobile phone and satellite data. *Journal of the Royal Society Interface*, 14(127), 1-10. doi: [10.1098/rsif.2016.0690](https://doi.org/10.1098/rsif.2016.0690)
- Blumenstock, J.E. (2016). Fighting Poverty with Data. *Science*, 353(6301), 753-754. doi: [10.1126/science.aah5217](https://doi.org/10.1126/science.aah5217)
- Blumenstock, J.E., Eagle, N., and Fafchamps, M. (2016). Airtime Transfers and Mobile Communications: Evidence in the Aftermath of Natural Disasters. *Journal of Development Economics*, 120, 157-181. doi: [10.1016/j.jdeveco.2016.01.003](https://doi.org/10.1016/j.jdeveco.2016.01.003)
- Blumenstock, J.E., Cadamuro, G., and R. On (2015). Predicting Poverty and Wealth from Mobile Phone Metadata. *Science*, 350(6264), 1073-1076. doi: [10.1126/science.aac4420](https://doi.org/10.1126/science.aac4420)

- Blumenstock, J.E. and N. Eagle (2012). Divided We Call: Disparities in Access and Use of Mobile Phones in Rwanda. *Information Technology and International Development*, 8(2), pp. 1-16.
- Blumenstock, J.E. (2012). Inferring Patterns of Internal Migration from Mobile Phone Call Records. *Information Technology for Development*, 18(2), pp. 107-125. doi: [10.1080/02681102.2011.643209](https://doi.org/10.1080/02681102.2011.643209)
- Gordon, G.J., R.V. Jensen, L.L. Hsiao, S.R. Gullans, J.E. Blumenstock, W.G. Richards, M.T. Jaklitsch, D.J. Sugarbaker, and R. Bueno (2003). Using Gene Expression Ratios to Predict Outcome Among Patients With Mesothelioma. *Journal of the National Cancer Institute*, 95(8), 598-605. doi: [10.1093/jnci/95.8.598](https://doi.org/10.1093/jnci/95.8.598)
- Gordon, GJ, RV Jensen, LL Hsiao, SR Gullans, JE Blumenstock, S Ramaswamy, WG Richards, DJ Sugarbaker, and R Bueno (2002). Translation of Microarray Data Into Clinically Relevant Cancer Diagnostic Tests Using Gene Expression Ratios in Lung Cancer and Mesothelioma. *Cancer Research*, 62(17), 4963-4967.
- Fryer, RM, J Randall, T Yoshida, LL Hsiao, JE Blumenstock, KE Jensen, T Dimofte, RV Jensen, and SR Gullans (2002). Global Analysis of Gene Expression: Methods, Interpretation, and Pitfalls. *Experimental Nephrology*, 10(2), 64-74. doi: [10.1159/000049901](https://doi.org/10.1159/000049901)
- Hsiao, LL, RV Jensen, T Yoshida, KE Clark, JE Blumenstock, and SR Gullans (2002). Correcting for Signal Errors in the Analysis of Microarray Data. *Biotechniques*, 32 (2), 330-337. doi: [10.2144/02322st06](https://doi.org/10.2144/02322st06)

## Conference and Workshop Proceedings (Computer Science Publications)

- Rolf, E., Simchowicz, M., Dean, S., Liu, L., Björkegren, D., Hardt, M., and Blumenstock, J.E. (2020). Balancing Competing Objectives for Welfare-Aware Machine Learning with Imperfect Data. *The Thirty-seventh International Conference on Machine Learning (ICML '20)*. Also awarded **Best Paper Award** at NeurIPS '19, Workshop on AI for Social Good.
- Aiken, E., Bedoya, G., Coville, A., Blumenstock, J.E. (2020). Targeting Development Aid with Machine Learning and Mobile Phone Data: Evidence from an Anti-Poverty Intervention in Afghanistan. *ACM SIGCAS Computing and Sustainable Societies (COMPASS '20)*, Guayaquil, Ecuador.
- Kohli, N., Aiken, E., and Blumenstock, J.E. (2020). Privacy Guarantees for Personal Mobility Data in Humanitarian Response. *The 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD '20), Workshop on Humanitarian Mapping*, San Diego, CA.
- Keleher, N., Barela, M.C., Blumenstock, J.E., Festin, C., Podolsky, M., Rezaee, A., Troland, E., Heimerl, K. (2020). Connecting Isolated Communities: Quantitative Evidence on the Adoption of Community Cellular Networks in the Philippines. *The 11th IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD '20)*, Guayaquil, Ecuador.
- Björkegren, D., Blumenstock, J.E., and Knight, S. (2019). (Machine) Learning what Governments Value. *The Thirty-third Annual Conference on Neural Information Processing Systems (NeurIPS '19), Workshop on Machine Learning for the Developing World*, Toronto, CA.
- Khan, M.R. and Blumenstock, J.E. (2019). Multi-GCN: Graph Convolutional Networks for Multi-View Networks, with Applications to Global Poverty. *The Thirty-Third AAAI Conference on Artificial Intelligence (AAAI '19)*, Honolulu, HI. arXiv: [1901.11213](https://arxiv.org/abs/1901.11213)
- Cadamuro, G., Vinayak, R.K., Shapiro, J.N., Blumenstock, J.E., and Kakade, S. (2019). The Illusion of Change: Correcting for Bias when Inferring Changes in Sparse, Societal-Scale Data. *The 30th Annual Web Conference 2019 (WWW '19)*, San Francisco, CA. doi: [10.1145/3308558.3313722](https://doi.org/10.1145/3308558.3313722)

- Chi, G., State, B., Blumenstock, J.E., and Adamic, L. (2019). Who ties the world together? Evidence from a Large Online Social Network. *The 8th International Conference on Complex Networks and their Applications (COMPLEX NETWORKS '19)*. Lisbon, Portugal. doi: [10.1007/978-3-030-36683-4\\_37](https://doi.org/10.1007/978-3-030-36683-4_37)
- Aulck, L., Nambi, D., Velagapudo, N., Blumenstock, J.E., West, J. (2019). Mining University Registrar Records to Predict First-Year Undergraduate Attrition. *The 12th International Conference on Educational Data Mining (EDM '19)*, Montreal, Canada.
- Weld, G., Perrier, T., Aker, J., Blumenstock, J.E., Dillon, B., Kamazi, A., Kokushubira, E., Webster, J., and Anderson, R. (2018). eKichabi: Information Access through Basic Mobile Phones in Rural Tanzania. *The 2018 ACM Conference on Human Factors in Computing Systems (CHI '18)*, Montreal, Canada. doi: [10.1145/3173574.3173707](https://doi.org/10.1145/3173574.3173707)
- Khan, M.R. and Blumenstock, J.E. (2017). Determinants of Mobile Money Adoption in Pakistan. *The Thirty-first Annual Conference on Neural Information Processing Systems (NeurIPS '17), Workshop on Machine Learning for the Developing World*, Long Beach, CA. arXiv: [1712.01081](https://arxiv.org/abs/1712.01081)
- Blumenstock, J.E., Maldeniya, D., and Lokanathan, S. (2017). Understanding the Impact of Urban Infrastructure: New Insights from Population-Scale Data. *The 9th IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD '17)*, Lahore, Pakistan. doi: [10.1145/3136560.3136575](https://doi.org/10.1145/3136560.3136575)
- Head, A., Manguin, M., Tran, N., and Blumenstock, J.E. (2017). Can Human Development be Measured with Satellite Imagery? *The 9th IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD '17)*, Lahore, Pakistan. doi: [10.1145/3136560.3136576](https://doi.org/10.1145/3136560.3136576)
- Shah, K., Martinez, P., Blumenstock, J.E., Dionisio, J., and Heimerl, K. (2017). An Investigation of Phone Upgrades in Remote Community Cellular Networks. *The 9th IEEE/ACM Int'l Conference on Information and Communication Technologies and Development (ICTD '17)*, Lahore, Pakistan. doi: [10.1145/3136560.3136569](https://doi.org/10.1145/3136560.3136569)
- Khan, M.R. and Blumenstock, J.E. (2016). Predictors without Borders: Behavioral Modeling of Product Adoption in Three Developing Countries. *The 22nd ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD '16)*, San Francisco, CA. doi: [10.1145/2939672.2939710](https://doi.org/10.1145/2939672.2939710)
- Aulck, L., Blumenstock, J.E., and West, J. (2016). Predicting Student Dropout in Higher Education. *The 33rd International Conference on Machine Learning (ICML '16), Workshop on Machine Learning in Social Good Applications*, New York, NY. arXiv: [1606.06364](https://arxiv.org/abs/1606.06364)
- Khan, M.R. and Blumenstock J.E. (2016). Machine Learning Across Cultures: Modeling the Adoption of Financial Services for the Poor. *The 33rd International Conference on Machine Learning (ICML '16), Workshop on Machine Learning in Social Good Applications*, New York, NY. arXiv: [1606.05105](https://arxiv.org/abs/1606.05105)
- Blumenstock, J.E., Keleher, N., and Reisinger, J. (2016). The Premise of Local Information: Building Reliable Economic Indicators from a Decentralized Network of Contributors. *The 8th IEEE/ACM International Conference on Information and Communication Technologies and Development, Notes Track (ICTD '16)*, Ann Arbor, MI. doi: [10.1145/2909609.2909646](https://doi.org/10.1145/2909609.2909646)
- Khan, M.R., Reed, P., and Blumenstock, J.E. (2016). Observing gender dynamics and disparities with mobile phone metadata. *The 8th IEEE/ACM International Conference on Information and Communication Technologies and Development, Notes Track (ICTD '16)*, Ann Arbor, MI. doi: [10.1145/2909609.2909632](https://doi.org/10.1145/2909609.2909632)
- Blumenstock, J.E. & Keleher, N. (2015). The Price Is Right? Statistical evaluation of a crowd-sourced market information system in Liberia. *The 5th Annual ACM Symposium on Computing for Development (DEV '15)*, London, U.K. (23% Acceptance). Best paper nominee (top 3 papers). doi: [10.1145/2830629.2830647](https://doi.org/10.1145/2830629.2830647)

- Blumenstock, J.E., Callen, M., Ghani, T., and Koepke, L. (2015). Promises and Pitfalls of Mobile Money in Afghanistan: Evidence from a Randomized Control Trial. *The 7th IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD '15)*, Singapore. doi: [10.1145/2737856.2738031](https://doi.org/10.1145/2737856.2738031)
- Khan, M.R., Manoj, J., Singh, A., and Blumenstock, J.E. (2015). Behavioral Modeling for Churn Prediction: Early Indicators and Accurate Predictors of Customer Defection and Loyalty. *2015 IEEE International Congress on Big Data (Big Data '15)*, New York, NY. doi: [10.1109/BigData-Congress.2015.107](https://doi.org/10.1109/BigData-Congress.2015.107)
- Blumenstock J.E. (2014). Calling for Better Measurement: Estimating an Individuals Wealth and Well-Being from Mobile Phone Transaction Records. *The 20th ACM Conference on Knowledge Discovery and Mining (KDD '14), Workshop on Data Science for Social Good*, New York, NY.
- Young, W.M., Blumenstock, J.E., Fox, E.B., and McCormick, T.M. (2014). Detecting and classifying anomalous behavior in spatiotemporal network data. *The 20th ACM Conference on Knowledge Discovery and Mining (KDD '14), Workshop on Data Science for Social Good*, New York, NY.
- Blumenstock, J.E., Chokkalingham, R., Gaikwad, V., and Kondepudi, S. (2014). Probabilistic Inference of Unknown Locations: Exploiting Collective Behavior when Individual Data is Scarce. *The 5th ACM Symposium on Computing for Development (DEV '14)*, San Jose, CA. doi: [10.1145/2674377.2674387](https://doi.org/10.1145/2674377.2674387)
- Kelley, I. & Blumenstock, J.E. (2014). Computational Challenges in the Analysis of Large, Sparse, Spatiotemporal Data. *The 6th ACM International Workshop on Data Intensive Distributed Computing (DIDC '14)*, Vancouver, Canada. doi: [10.1145/2608020.2608025](https://doi.org/10.1145/2608020.2608025)
- Blumenstock, J.E. & Fratamico, F. (2013). Social and Spatial Ethnic Segregation: A Framework for Analyzing Segregation With Large-Scale Spatial Network Data. *The 4th Annual ACM Symposium on Computing for Development (DEV '13)*, Cape Town, South Africa. doi: [10.1145/2537052.2537061](https://doi.org/10.1145/2537052.2537061)
- McCarthy, T, DeRenzi, B, Blumenstock, J.E., & Brunskill, E. (2013). Operationalizing Outlier Detection in Community Health Programs. *The 6th IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD '13)*, Cape Town, South Africa. doi: [10.1145/2517899.2517919](https://doi.org/10.1145/2517899.2517919)
- Heimerl, K., Ali, K, Blumenstock, J.E., Gawalt, B., & Brewer, E. (2013). Expanding Rural Cellular Networks with Virtual Coverage. *the 10th USENIX Symposium on Networked Systems Design and Implementation (NSDI '13)*, Lombard, IL. **Community Award (for social impact)**.
- Blumenstock, J.E., Eagle, N., and Fafchamps, M. (2012). Risk and Reciprocity in Mobile Money. *Pacific Telecommunications Conference (PTC '12)*, Honolulu, HI. **Best Student Paper Award**.
- Mehrohtra, A., Mohan, M., Nguyen, A., & Blumenstock, J.E. (2012). The Role of Gender in Mobile Phone Use: Quantitative Evidence from Rwanda. *Proc. 5th IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD '12)*, Atlanta, GA. doi: [10.1145/2160673.2160710](https://doi.org/10.1145/2160673.2160710)
- Blumenstock, J.E. & Eagle, N. (2011). Mobile Divides: Gender, Socioeconomic Status, and Mobile Phone Use in Rwanda. *Proceedings of the 4th IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD '10)*, London, UK (14.1% Acceptance). doi: [10.1145/2369220.2369225](https://doi.org/10.1145/2369220.2369225)
- Blumenstock, J.E. (2011). Using Mobile Phone Data to Measure the Ties Between Nations. *Proceedings of the 2011 iConference*. ACM Press, pp. 195-202. doi: [10.1145/1940761.1940788](https://doi.org/10.1145/1940761.1940788)
- Blumenstock, J.E., Shen, Y., & Eagle, N. (2010). A Method for Estimating the Relationship Between Phone Use and Wealth. *Proceedings of the QualMeetsQuant Workshop at ICTD '10*.



- Blumenstock, J.E., Gillick, D., & Eagle, N. (2010). Who’s Calling? Demographics of Mobile Phone Use in Rwanda. *2010 AAAI Spring Symposium Series*. AAAI Publications, pp. 116-117.
- Blumenstock, J.E. (2008). Size Matters: Word Count as a Measure of Quality on Wikipedia. *Proceedings of the 17th International Conference on the World Wide Web (WWW ‘08)* (pp. 1095-1096). ACM Press. doi: [10.1145/1367497.1367673](https://doi.org/10.1145/1367497.1367673)
- Gemmell, J, R Lueder, JE Blumenstock, E Solomon, and G Bell (2003). Telephone, Television and Radio in the Home of the Future. *Internet and Multimedia Systems and Applications*, 2003, 263-268.

## Book Chapters and Other Publications

- Blumenstock, J.E., Callen, M., and Ghani, T. (2018). How Employers in Poor Countries Are Using Nudges to Help Employees Save Money. *Harvard Business Review Online*. June 15, 2018.
- Blumenstock, J.E. (2018). Design and Practice of Mobile Money. In: Maurer, B., Muharaj, S., & Small, I. *Money at the Margins Global Perspectives on Technology, Financial Inclusion and Desig.* pp. 354-371. Berghahn Books.
- Aker, J.C. and Blumenstock, J.E. (2014). The Economic Impacts of New Technologies in Africa. In: Monga, C. & Lin, J.Y. *The Oxford Handbook of Africa and Economics*. pp. 354-371. Oxford University Press.

## Working Papers and Selected Works in Progress

- “Migration and the Value of Social Networks” (with Guanghua Chi and Xu Tan). *Revise and Resubmit, Review of Economic Studies*.
- “Global Micro-Estimates of Wealth and Poverty” (with Guanghua Chi). *Revise and Resubmit, Nature*.
- “Yellow Pages: Experimental Evidence on the Value of Firm-Household Connections” (with Brian Dillon and Jenny Aker). *In Submission*.
- “How Do Firms Respond to Insecurity? Evidence from Afghan Corporate Phone Records” (with Tarek Ghani, Sylvan Herskowitz, Ethan B. Kapstein, Thomas Scherer, and Ott Toomet). *In Submission*.
- “Manipulation-Proof Machine Learning” (with Dan Björkegren and Samsun Knight). *Working Paper*. [arXiv: 2004.03865](https://arxiv.org/abs/2004.03865)
- “Can Mobile Phone Data Identify the Ultra-Poor?” (with Emily Aiken). *In Working Paper*.
- “(Machine) Learning what Governments Value” (with Dan Björkegren and Samsun Knight). *Working Paper*.
- “Digital Credit: A Snapshot of the Current Landscape” (with Eilin Francis and Jonathan Robinson). *BREAD Working Paper No. 516*.
- “The Impact of Mobile Phones: Experimental Evidence from the Random Assignment of New Cell Towers” (with Niall Keleher, Arman Rezaee, and Erin Troland). *Working Paper*.
- “Violence and Financial Decisions: Experimental Evidence from Mobile Money in Afghanistan” (with Michael Callen, Tarek Ghani, and Robert Gonzalez). *Working Paper*.
- “Gamblers Learn from Experience” (with Matthew Olckers). *In Submission*. [arXiv: 2011.00432](https://arxiv.org/abs/2011.00432)
- “A Society of Silent Separation: The Impact of Migration on Ethnic Segregation in Estonia” (with Ott Toomet). *Working Paper*.

- “Privacy-Preserving Prediction Algorithms” (with Moritz Hardt and Nitin Kohli). *In Progress*.
- “(Machine) Learning to Improve Welfare” (with Dan Björkegren, Jacqueline Mauro, and Suraj Nair). *In Progress*.
- “Real-Time Measures of Poverty and Vulnerability” (with Michael Callen, Tarek Ghani, Niall Keleher, and Jacob Shapiro). *In Progress*.
- “Government Mobile Salary Payments: Experimental Evidence from Afghanistan” (with Michael Callen, Anastasiia Faikina, Stefano Fiorin, and Tarek Ghani). *In Progress*.
- “How Do Labor Markets Equilibrate? Estimating the Effect of Local Labor Demand Shocks on Internal Migration and Local Wages” (with Dave Donaldson). *In Progress*.

## Research Funding

- National Science Foundation (2020). CAREER (Faculty Early Career Award): Welfare-Centric Machine Learning. Budget: \$451,000.
- Ripple Foundation (2020). Fintech and Financial Inclusion Initiative (with Paul Gertler). Budget: \$1,000,000.
- Innovations for Poverty Action (2020). Welfare Scoring for Digital Credit (with Dan Björkegren). Budget: \$145,000.
- C3.ai Digital Transformation Institutes (2020). Housing Precarity, Eviction, and Inequality in the Wake of COVID-19 (with Karen Chapple and Matthew Desmond). Budget: \$375,000.
- Center for Information Technology Research in the Interest of Society (2020). Privacy Guarantees for the use of Personal Location Data in COVID models. Budget: \$50,000.
- Social Science Research Council (2020). Covid-19 Social Impact Scenarios: Bridging the Knowledge Gap between Technical System Outputs and Policymaking.
- Abdul Latif Jameel Poverty Action Lab (2020). Using mobile phone and satellite data to target Togo’s emergency cash transfer program (with Dean Karlan and Chris Udry). Budget: \$25,000.
- Defense Advanced Research Projects Agency (2019), Brandeis Program. Privacy-Preserving Prediction (with Moritz Hardt). Budget: \$365,000.
- Amazon Machine Learning Research Award (2019). AWS Credit: \$20,000.
- Google Cloud Compute Award (2019). GCP Credit: \$10,000.
- Facebook (2019). Research gift: \$55,000.
- Hellman Foundation (2018). Faculty Research Award. Budget: \$60,000.
- Philippines Commission on Higher Education (2018). Scalable Community Access Networks. Budget: \$400,000.
- Bill and Melinda Gates Foundation (2017). Digital Credit Observatory (with Jon Robinson). Budget: \$4,060,000.
- USAID/NETHOPE (2017): Community Cellular Networks. Budget: \$100,000.
- Okawa Foundation (2017). Okawa Research Grant. Budget: \$10,000.
- Facebook (2017). Research gift: \$100,000.
- Office of Naval Research (2017). Spectral Models of Security (with Sham Kakade and Jacob Shapiro). Budget: \$1,195,000.
- National Science Foundation (2017). Algorithms in the Field (with Sham Kakade). Budget: \$600,000.
- Laura and John Arnold Foundation (2016). Afghanistan Mobile Salary Payments (with Michael Callen and Tarek Ghani). Budget: \$1,385,000.

- National Science Foundation (2016). Compact Models of Massive Social Graphs (with Tyler McCormick). Budget: \$150,000.
- Bill & Melinda Gates Foundation (2016). Integrating Isolated Communities. Budget: \$150,000.
- World Bank Group (2016). Conflict and Private Sector Development (with Tarek Ghani and Ethan Kapstein). Budget: \$255,000.
- International Growth Centre (2016). Government Mobile Salary Payments in Afghanistan (with Michael Callen and Tarek Ghani). Budget: \$60,000.
- Bill & Melinda Gates Foundation (2015). Millennium Grand Challenge Explorations: Measuring the Availability and Use of Digital Financial Services. Budget: \$100,000.
- Development Innovation Labs (2015). Pilot Study: How Does First-Time Access to the Mobile Phone Network Affect Remote Communities in the Philippines? (with Eric Brewer and Kurtis Heimerl). Budget: \$45,000.
- International Growth Centre (2015). High-Resolution Measures of Poverty and Vulnerability in Afghanistan (with Michael Callen). Budget: \$62,000.
- Bill & Melinda Gates Foundation (2015). Mobile Data for Socioeconomic Indicators (with Linus Bengtsson, Caroline Buckee, Andy Tatem, and Erik Wetter). Budget: \$754,794.
- UW Royalty Research Fund (2015). Migration and Networks: Theory and Evidence from Rwanda (with Xu Tan). Budget: \$39,881.
- USAID Development Innovation Laboratory (2014). High-Resolution Development Indicators. Budget: \$255,000.
- International Growth Centre (2014). Modelling Urban Growth and Agglomeration with Large-Scale Mobile Phone Data (with Saad Gulzar and Sriganesh Lokanathan). Budget: \$60,000.
- UW Royalty Research Fund (2014). Segregation and “Silent Separation”: Using Large-Scale Network Data to Model the Determinants of Ethnic Segregation. Budget: \$39,657.
- IZA/DFID Growth and Labour Markets in Low Income Countries (2013). The Effect of Local Labor Demand Shocks on Internal Migration and Local Wages (with Dave Donaldson). Budget: \$430,000.
- Google Faculty Research Award (2013). Shock Signals: Modeling the Response of Dynamic Spatial Networks to Severe, Unexpected Shocks. Budget: \$40,390.
- Intel (2013). Early Career Faculty Honor Award. Award: \$40,000.
- Costco (2013). Research Gift: \$60,000.
- Innovations for Poverty Action (2013). Mobile Phone-Based Defined-Contribution Accounts in Afghanistan (with Michael Callen and Tarek Ghani). Budget: \$150,000.
- Institute for Money, Technology, and Financial Inclusion (2012). Case Studies of Mobile and Other Monies in Afghanistan (with Jan Chipchase). Budget: \$93,434.
- Center for Economic Policy Research (2012). Private Enterprise Development in Low Income Countries: Using Mobile Money to Pay Afghan Salaries (with Michael Callen and Tarek Ghani). Budget: \$35,500.
- Consortium on Financial Systems and Poverty (2012). Mobile Salary Payments in Afghanistan (with Michael Callen and Tarek Ghani). Budget: \$33,836.
- National Science Foundation (2011). Doctoral Dissertation Improvement Award: Risk Sharing Over the Rwandan Mobile Phone Network. Budget: \$11,500.
- International Growth Centre (2010). Social Networks, Phone Money Transfers, and Rainfall Shocks (with Marcel Fafchamps and Nathan Eagle). Budget: \$70,000.
- Institute for Money, Technology and Financial Inclusion (2010). Banking on the Phone: Using Novel Sources of Data to Understand the Impact of Mobile Banking in Rwanda. Budget: \$16,500.
- Networks, Electronic Commerce, and Telecommunications Institute (2010). Summer Research Grant: Mobile Phone Response to Natural Disasters. Budget: \$4,500.



- Bill and Melinda Gates Foundation (2009). Summer Research Grant: Information and Communication Technologies for Agriculture. Budget: \$3,500.
- Intel Research (2009). Cultural Politics of Technology and Consumption: Mobile Phone Use in Rwanda. Budget: \$5,000.
- Thomas J. Watson Foundation (2004). Watson Fellowship: Outreach or Evangelism? Integrating Technology into Unexposed Communities: China, South Africa, Cape Verde, Argentina, Costa Rica. Budget: \$22,000.

## Invited Keynotes and Seminars

### 2020

- United Nations Statistics Division / OECD (*Keynote Speaker*, Conference on New Data Sources and Statistical Capacity), World Bank Conference on Data Integration and Data Fusion (*Keynote Speaker*), International Conference on Computational Social Science (*Keynote Speaker*), Bureau for Research and Economic Analysis of Development (Summer 2020 conference), Cornell University (Milstein Speaker Series), U.C. Berkeley (Distinguished Lectures in Data Science), MIT (Sloan Analytics Lab).

### 2019

- World Bank (*Keynote Speaker*, Human Development Forum), El Colegio de México (*Keynote Speaker*, Conference on Big Data in the Social Sciences), NBER (Economics of AI Conference), Microsoft Research New England (Economics Seminar), Brown University (Applied Micro Seminar), International Food Policy Research Institute (Applied Microeconomics Seminar), World Bank (Poverty and Equity Seminar), University of Zürich (Development/Trade Seminar), Instituto Tecnológico Autnomo de México (Department Seminar), Universidade NOVA de Lisboa (Development Seminar), University of San Francisco (Department Seminar)

### 2018

- London School of Economics (BREAD/CEPR/LSE/TCD Workshop in Development Economics), NeurIPS (*Keynote Speaker*, Workshop on ML for the Developing World), Paris School of Economics (Development Seminar), MIT (*Plenary Speaker*, Conference on Digital Experimentation), Stanford University (*Keynote Speaker*, ICWSM MPIDR Workshop), Google (Tech Talk), U.C. Berkeley (Oliver Williamson Seminar), AI for Economic Development Conference (*Keynote Speaker*), Paris School of Economics (Migration Seminar), University of Göttingen (Development Seminar), Development Economics Network (DENeB), U.C. Berkeley (Management of Organizations Seminar)

### 2017

- Stanford University (Development Seminar), University of Washington (Joint Seminar in Development Economics), World Bank (Global Poverty Seminar), Universitat Pompeu Fabra (Barcelona Summer Forum), Digital Credit Observatory (*Keynote Speaker*), Dartmouth University (Economics Departmental Seminar), Economic Demography Workshop (PAA), U.C. Berkeley (Development Economics Seminar), U.C. Berkeley (EECS Pro Seminar), U.C. Berkeley (BIDS Data Science Lecture)

### 2016

- Stanford University (CDDRL Seminar), 8th International Conference on Social Informatics (*Keynote Speaker*), Research and Policy on Big Data for the Global South (*Keynote Speaker*), U.C. Berkeley (Effective Altruism Conference), University of California Los Angeles (Institute for Pure and Applied Mathematics), Google (Financial Technology for Development), Wesleyan University (Digital and Computational Knowledge Seminar), Stanford University (AAAI Spring Symposium), Microsoft Research

(Economics Seminar)

## 2015

- University of Chicago (Political Economy Seminar), Princeton University (Political Methodology Seminar), UC San Diego (Development Economics Seminar), National Academy of Sciences (Committee on National Statistics), University of Philippines (Computer Science Department Seminar), World Bank (Conference on Labor Markets in Low-Income Countries), UC Berkeley (CEGA R2), Yale University (Researcher Gathering on Financial Behavior), University of Washington (Institute for Health Metrics and Evaluation), University of Washington (Center for Statistics and the Social Sciences), UC Irvine (Information and Computer Science Department)

## 2014

- International Telecommunications Union (Mobile Data and Development); World Bank (Big Data for Development Symposium); University of Maryland, College Park (Information School Seminar); University of Washington (DUB seminar); LIRNEAsia Sri Lanka (Data and Development Forum); Stanford University (Freeman Spogli Institute for International Studies); University of California, Berkeley, CA (Electrical Engineering and Computer Science)

## 2013

- University of Washington (Economics Department Seminar); IZA Germany (World Bank Conference on Employment and Development); Microsoft Research (Faculty Summit); Massachusetts Institute of Technology (NetMob 2013); Microsoft Research New England (Economics Seminar); University of Washington (Departmental Colloquium, Computer Science & Engineering); University of Washington (Change Seminar); Massachusetts Institute of Technology (IPA/PEDL Workshop on Small and Medium Enterprise in Developing Regions)

## 2012

- U.C. Berkeley (USAID Workshop on Technology & Development); Asian Development Bank, Bangkok (Conference on Financial Inclusion); U.C. San Diego (Evaluating Mobile Innovations for Security and Accountability); Stanford University (Liberation Technologies Seminar); LSU (NSF Conference on Networks & Development); University of Michigan (Information School); Michigan State University (Dept. of Agricultural and Resource Economics); University of Washington (Information School); University of San Francisco (Economics Department Seminar); Pacific Technology Consortium; UT Austin (Lyndon B. Johnson School of Public Policy); University of Maryland (Information School); Michigan State University (Dept. Telecommunication, Information Studies & Media); Georgetown University (Dept. Communications, Culture & Technology)

## Teaching

### University of California, Berkeley

- INFO 288: Big Data and Development
- INFO 251: Applied Machine Learning
- INFO 290: Information and Communications Technology and Development

### University of Washington

- INFX 574: Advanced Methods in Data Science
- INFX 573: Introduction to Data Science

- INFX 598: Big Data and Development
- INFO 371: Advanced Methods in Data Science (undergrad)

### **Kigali Institute of Science and Technology, Rwanda**

- KIST: Survey and Research Design and Methods

## **Advising**

### **Post-Doctoral Supervisor**

- Jacqueline Mauro (*ongoing* - PhD in Statistics and Public Policy, Carnegie Mellon University)
- Xiao Hui Tai (*ongoing* - PhD in Statistics and Data Science, Carnegie Mellon University)
- Shekhar Mittal (*ongoing* - PhD in Economics, UCLA)
- Micky Fire (Assistant Professor, Ben-Gurion University)
- Ott Toomet (Adjunct Assistant Professor, University of Washington)

### **Doctoral Committee Chair**

- Robert On (Ph.D. 2019, Chan Zuckerberg Initiative)
- Muhammad Raza Khan (Ph.D. 2019, Microsoft Research)
- Niall Keleher (Ph.D. 2019, Stanford)
- Guanghua Chi (*ongoing* - U.C. Berkeley - School of Information)
- Emily Aiken (*ongoing* - U.C. Berkeley - School of Information)
- Suraj Nair (*ongoing* - U.C. Berkeley - School of Information)
- Simón Ramirez Amaya (*ongoing* - U.C. Berkeley - School of Information)
- Gabriel Cadamuro (*ongoing* - University of Washington - CSE, joint chair with Sham Kakade)

### **Undergraduate Research Apprenticeship Program (Supervisor)**

- Cathryn Casatuta, Michael Chang, Daniel Cohen, Paige Dunn-Rankin, Lauren Fratamico, Sergey Goder, Pauline Hidalgo, Varun Jadia, Minchao Lin, Andrew Linxie, Diana Louie, Anita Mehrotra, Viraj Mohan, Ashley Nguyen, Jack (Ye) Shen, Yian Shen, Ana Tudor, Jeffrey Wirjo, SioFong Wong, Amanda Wu, Edward Yam, Katherine Yen.

## **Professional Service**

### **Journals**

- Associate Editor, *Development Engineering*
- *Referee Service (Selected)*: American Economic Review; AER: Insights; Communications of the ACM, EPJ Data Science; Journal of Development Economics; Nature; Nature: Human Behavior; PLoS One; Proceedings of the National Academy of Sciences; Quarterly Journal of Economics; Review of Economics and Statistics; Review of Economic Studies; Science; World Bank Economic Review; World Development.

### **Conferences**

- *Conference Chair*: Evaluating Mobile Innovations for Security and Accountability, San Diego, 2012.
- *Program Chair*: Mobile Money Challenges and Innovations, Berkeley, 2013.

- *Senior Program Committee:* ICTD 2019 (Ahmedabad, India), ICTD 2017 (Lahore, Pakistan), ICTD 2016 (Ann Arbor, MI), ICTD 2015 (Singapore, Singapore), ICTD 2013 (Cape Town, South Africa).
- *Program Committee:* NeurIPS workshop on Machine Learning for the Developing World (ML4D 2019); ACM Symposium on Computing for Development: DEV 2015 (London, UK), DEV 2014 (Palo Alto, CA); 77th ASIS&T Meeting, 2014 (Seattle, WA); ACM 22nd International World Wide Web Conference (WWW 2013), Rio de Janeiro, 2013; ACM 21st International Conference on Information and Knowledge Management (CIKM 2012), Maui, 2012; ICTD 2010, London, UK.
- *Referee Service and Peer Review:* IEEE/ACM Conference on Information and Communication Technologies and Development (ICTD); Computing for Development (DEV); ACM Human Factors in Computing Systems (CHI); ACM Computer-Supported Cooperative Work (CSCW); ACM International Conference on Information and Knowledge Management (CIKM); Hawaii Int'l Conference on System Sciences (HICSS); AAAI Spring Symposium on Artificial Intelligence for Development (AAAI-D)