Eytan Bakshy

eytan@meta.com	http://eytan.github.io	770 Broadway, New York, NY 10003	
Research interests	Bayesian optimization, bandit optimization, meta-learning, causal inference, Bayesian machine learning, reinforcement learning, field experiments		
Education	University of Michigan	Ann Arbor, MI	
	PhD in Information Advisor: Lada Adamic	2007 – 2011	
	University of Illinois at Urbana-Ch	ampaign Champaign, IL	
	BS in Mathematics & Computer Science	e 2002 – 2006	
	High distinctions in mathematics Advisor: Karrie Karahalios		
Professional	Research Director, Adaptive Experin	mentation Team	
Experience	Meta	2021 – Present	
	Research Manager, Adaptive Experimentation Team		
	Meta	2016 - 2021	
	Research Scientist, Central Applied Science (formerly CDS)		
	Meta	2011 - 2016	
	Summer Intern, Data Science Team		
	Meta (formerly Facebook)	Summer 2010	
	Summer Intern, Yahoo! Research NYC		
	Yahoo!	Summer 2009	
	Graduate Student Research Assistant, School of Information		
	University of Michigan	2007 - 2011	
	Research Assistant, Center for Connected Learning		
	Northwestern University	2006 - 2007	
	Summer Intern, Center for Connected Learning		
	Northwestern University	Summer 2002 – 2006	
Peer-reviewed			

journal publications

Dean Eckles and Eytan Bakshy. Bias and high-dimensional adjustment in observational studies of peer effects. *Journal of the American Statistical Association*, (0):1–30, 2020

- Benjamin Letham and Eytan Bakshy. Bayesian optimization for policy search via online-offline experimentation. *Journal of Machine Learning Research* (*JMLR*), 20:145–1, 2019
- Benjamin Letham, Brian Karrer, Guilherme Ottoni, and Eytan Bakshy. Constrained bayesian optimization with noisy experiments. *Bayesian Analysis*, 14(2):495–519, 2019
- Jason J Jones, Robert M Bond, Eytan Bakshy, Dean Eckles, and James H Fowler. Social influence and political mobilization: Further evidence from a randomized experiment in the 2012 us presidential election. *PloS one*, 12(4):e0173851, 2017
- Dean Eckles, René F Kizilcec, and Eytan Bakshy. Estimating peer effects in networks with peer encouragement designs. *Proceedings of the National Academy of Sciences*, 113(27):7316–7322, 2016

Eytan Bakshy, Solomon Messing, and Lada Adamic. Exposure to ideologically diverse news and opinion on facebook. *Science*, 348(6239):1130–1132, 2015

Peer-reviewed conference publications

- Samuel Daulton, Maximilian Balandat, and Eytan Bakshy. Hypervolume knowledge gradient: A lookahead approach for multi-objective bayesian optimization with partial information. In *International Conference on Machine Learning (ICML)*, volume 40, 2023
- Sulin Liu, Qing Feng, David Eriksson, Benjamin Letham, and Eytan Bakshy. Sparse bayesian optimization. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, volume 26, 2023
- Aryan Deshwal, Sebastian Ament, Maximilian Balandat, Eytan Bakshy, Janardhan Rao Doppa, and David Eriksson. Bayesian optimization over highdimensional combinatorial spaces via dictionary-based embeddings. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, volume 26, 2023

- Raul Astudillo, Zhiyuan Jerry Lin, Eytan Bakshy, and Peter I Frazier. qeubo: A decision-theoretic acquisition function for preferential bayesian optimization. In *International Conference on Artificial Intelligence and Statistics (AIS-TATS)*, volume 26, 2023
- Mia Garrard, Hanson Wang, Ben Letham, Shaun Singh, Abbas Kazerouni, Sarah Tan, Zehui Wang, Yin Huang, Yichun Hu, Chad Zhou, et al. Practical policy optimization with personalized experimentation. In *NeurIPS Workshop on Causal Inference Challenges in Sequential Decision Making: Bridging Theory and Practice*, 2023
- Samuel Daulton, Xingchen Wan, David Eriksson, Maximilian Balandat, Michael A Osborne, and Eytan Bakshy. Bayesian optimization over discrete and mixed spaces via probabilistic reparameterization. *Advances in Neural Information Processing Systems (NeurIPS)*, 2022
- Samuel Daulton, Sait Cakmak, Maximilian Balandat, Michael A Osborne, Enlu Zhou, and Eytan Bakshy. Robust multi-objective bayesian optimization under input noise. In *International Conference on Machine Learning (ICML)*, volume 39, 2022 **Oral**.
- Igor L Markov, Hanson Wang, Nitya Kasturi, Shaun Singh, Sze Wai Yuen, Mia Garrard, Sarah Tran, Yin Huang, Zehui Wang, Igor Glotov, et al. Looper: An end-to-end ml platform for product decisions. In *Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, 2022
- Han Wu, Sarah Tan, Weiwei Li, Mia Garrard, Adam Obeng, Drew Dimmery, Shaun Singh, Hanson Wang, Daniel Jiang, and Eytan Bakshy. Interpretable personalized experimentation. In *Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, pages 4173–4183, 2022
- Samuel Daulton, David Eriksson, Maximilian Balandat, and Eytan Bakshy. Multi-objective bayesian optimization over high-dimensional search spaces. In *Conference on Uncertainty in Artificial Intelligence (UAI)*, volume 38, 2022 **Oral**.

- Zhiyuan Jerry Lin, Raul Astudillo, Peter I Frazier, and Eytan Bakshy. Preference exploration for efficient bayesian optimization with multiple outcomes. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, volume 25, 2022
- Benjamin Letham, Phillip Guan, Chase Tymms, Eytan Bakshy, and Michael Shvartsman. Look-ahead acquisition functions for bernoulli level set estimation. In *International Conference on Artificial Intelligence and Statistics* (AISTATS), volume 25, 2022
- Wesley J Maddox, Maximilian Balandat, Andrew Gordon Wilson, and Eytan Bakshy. Bayesian optimization with high-dimensional outputs. In Advances in Neural Information Processing Systems (NeurIPS), 2021
- Samuel Daulton, Maximilian Balandat, and Eytan Bakshy. Parallel bayesian optimization of multiple noisy objectives with expected hypervolume improvement. Advances in Neural Information Processing Systems (NeurIPS), 2021
- Raul Astudillo, Daniel Jiang, Maximilian Balandat, Eytan Bakshy, and Peter Frazier. Multi-step budgeted bayesian optimization with unknown evaluation costs. In Advances in Neural Information Processing Systems (NeurIPS), 2021
- Qing Feng, Benjamin Letham, Hongzi Mao, and Eytan Bakshy. Highdimensional contextual policy search with unknown context rewards using bayesian optimization. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020. **Spotlight**.
- Maximilian Balandat, Brian Karrer, Daniel Jiang, Samuel Daulton, Benjamin Letham, Andrew Gordon Wilson, and Eytan Bakshy. Botorch: A framework for efficient monte-carlo bayesian optimization. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020
- Samuel Daulton, Maximilian Balandat, and Eytan Bakshy. Differentiable expected hypervolume improvement for parallel multi-objective bayesian optimization. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020

- Benjamin Letham, Roberto Calandra, Akshara Rai, and Eytan Bakshy. Reexamining linear embeddings for high-dimensional bayesian optimization. In Advances in Neural Information Processing Systems (NeurIPS), 2020
- Emma Tosch, Eytan Bakshy, Emery D Berger, David D Jensen, and J Eliot B Moss. Planalyzer: Assessing threats to the validity of online experiments. *Proceedings of the ACM on Programming Languages*, 3(OOPSLA):1–30, 2019
- Drew Dimmery, Eytan Bakshy, and Jasjeet Sekhon. Shrinkage estimators in online experiments. In *Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining*, pages 2914–2922, 2019
- René F Kizilcec, Eytan Bakshy, Dean Eckles, and Moira Burke. Social influence and reciprocity in online gift giving. In *Proceedings of the 2018 CHI conference on human factors in computing systems*, pages 1–11, 2018
- Eytan Bakshy and Eitan Frachtenberg. Design and analysis of benchmarking experiments for distributed internet services. In *Proceedings of the 24th international conference on World Wide Web.* ACM, 2015
- Eytan Bakshy, Dean Eckles, and Michael S Bernstein. Designing and deploying online field experiments. In *Proceedings of the 23rd international conference on World wide web*, pages 283–292, 2014
- Sean Taylor, Eytan Bakshy, and Sinan Aral. Selection effects in online sharing: Consequences for peer adoption. In *Proceedings of the 14th ACM Conference on Electronic Commerce*, 2013
- Eytan Bakshy and Dean Eckles. Uncertainty in online experiments with dependent data: An evaluation of bootstrap methods. In *Proceedings of the 19th ACM SIGKDD conference on knowledge discovery and data mining*. ACM, 2013
- Michael S Bernstein, Eytan Bakshy, Moira Burke, and Brian Karrer. Quantifying the invisible audience in social networks. In *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI 2013)*, 2013

- Eytan Bakshy, Dean Eckles, Rong Yan, and Itamar Rosenn. Social influence in social advertising: Evidence from field experiments. In *Proceedings of the* 13th ACM Conference on Electronic Commerce, pages 146–161. ACM, 2012
- Eytan Bakshy, Itamar Rosenn, Cameron Marlow, and Lada Adamic. The role of social networks in information diffusion. In *Proceedings of the 21st inter-national conference on World Wide Web*, pages 519–528. ACM, 2012
- Eytan Bakshy, Jake M Hofman, Winter A Mason, and Duncan J Watts. Everyone's an influencer: Quantifying influence on twitter. In *Proceedings of the 4th ACM international conference on Web search and data mining*, pages 65–74. ACM, 2011. **Test of Time Award (2021).**
- Lars Backstrom, Eytan Bakshy, Jon Kleinberg, Thomas M Lento, and Itamar Rosenn. Center of attention: How facebook users allocate attention across friends. In *Proc. 5th International Conference on Weblogs and Social Media*, 2011
- David A Huffaker, Matthew Simmons, Eytan Bakshy, and Lada A Adamic. Seller activity in a virtual marketplace. *First Monday*, 2010
- Eytan Bakshy, Matthew P Simmons, David A Huffaker, Chun-Yuen Teng, and Lada A Adamic. The social dynamics of economic activity in a virtual world. In *Proc. of 4th International AAAI Conference on Weblogs and Social Media*, 2010 **Best Paper Award**.
- Eytan Bakshy, Brian Karrer, and Lada A Adamic. Social influence and the diffusion of user-created content. In *Proceedings of the 10th ACM conference on Electronic commerce*, pages 325–334. ACM, 2009
- Lada A Adamic, Jun Zhang, Eytan Bakshy, and Mark S Ackerman. Knowledge sharing and yahoo answers: Everyone knows something. In *Proceeding of the 17th international conference on World Wide Web*, pages 665–674. ACM, 2008

Refereed workshop

papersSamuel Daulton, Shaun Singh, Vashist Avadhanula, Drew Dimmery, and Eytan
Bakshy. Thompson sampling for contextual bandit problems with auxiliary
safety constraints. In NeurIPS Workshop on Safety and Robustness in Deci-
sion Making, 2019

	Hongzi Mao, Shannon Chen, Drew Dimmery, Shaun Sing Yuandong Tian, Mohammad Alizadeh, and Eytan Bakshy adaptation with reinforcement learning. In <i>NeurIPS Wo</i> <i>inforcement Learning</i> , 2019	gh, Drew Blaisdell, 19. Real-world video Yorkshop on Deep Re-	
	Eytan Bakshy, Lili Dworkin, Brian Karrer, Konstantin Letham, Ashwin Murthy, and Shaun Singh. Ae: A dor form for adaptive experimentation. In <i>NeurIPS Works</i> <i>Machine Learning</i> , 2018	Kashin, Benjamin nain-agnostic plat- hop on Systems for	
	Matthias Feurer, Benjamin Letham, and Eytan Bakshy. Scal for bayesian optimization using ranking-weighted ga sembles. In <i>ICML Workshop on AutoML</i> , 2018	able meta-learning ussian process en-	
Awards	ACM WSDM Test of Time Award	2021	
	SIGPLAN Research Highlight	2020	
	Yahoo! Innovative Teaching Award	2011	
	ICWSM Best Paper Award	2010	
	Yahoo! Key Scientific Challenges Program	2010	
	NSF IGERT Fellowship	2007-2008	
Invited Keynotes	AutoML Conference	September 2023	
	MIT Conference on Digital Experimentation	October 2022	
	NeurIPS Workshop on Machine Learning for Systems	December 2019	
	Uber Workshop on Bayesian Optimization	September 2019	
	KDD Workshop on Real World Reinforcement Learning	April 2019	
	MIT Conference on Digital Experimentation	October 2018	
	Stanford Workshop on Marketplace Innovation	April 2018	
Selected Invited			
Talks and Panels	JSM, Integrating Algorithms & Analysis in Adaptive Experiment August 2023		
	ICML Workshop: Multi-Objective Optimization meets Preferences July 2023		
	Google Workshop on Mobility: Simulation and Optimization	on June 2023	
	NeurIPS Tutorial on Advances in Bayesian Optimization	December 2022	
	INFORMS Session on Bayesian Optimization	October 2021	
	Frontiers in Causal Inference	June 2021	
	Univ. of Chicago Computational Social Science Workshop	December 2021	
	Online Causal Inference Seminar	June 2020	
	Stanford Seminar on Inference and Society	October 2019	
	Microsoft Research Seminar Series	May 2019	

	MIT Conference on Digital Experimentation (Panel)	October 2018	
	MIT Sloan	October 2017	
	Univ. of Pennsylvania Wharton	September 2017	
	Univ. of Vermont	February 2016	
	UCSF Biostatistics & Epidemiology	March 2015	
Skills	Programming Languages		
	Fluent in R, Python, SQL/Hive		
	Experience with Hack/PHP, JavaScript, Pig, JavaScript, Mathematica, Java,		
	C/C++		
	Frameworks		
	Experience with PyTorch, React, Google App Engine, Ha	doop/MapReduce	
Selected Service	Organizer		
	Meta Workshop on Bayesian Optimization	2023	
	Facebook Workshop on Adaptive Experimentation	2020	
	Facebook request for proposals in sample-efficient optim	ization 2021	
	Volunteer mentor: Women in Machine Learning 2018-2019		
	Area Chair: ICML 2023, AISTATS 2020-2023, NeurIPS 2021-2022, AutoML		
	Conference 2022-2023		
	Reviewer: AISTATS 2018, NeurIPS 2019-2020, ICML 2019-2020, EC 2010-2014,		
	WWW 2010-2015, CHI 2010, ICWSM 2009-2014		
	Collaboratories: NYU Social Media and Polititical Participation 2015-2018		
	Advisory Boards: University of Pennsylvania Advisory Committee for Scal-		
	ing Up Experimental, Social and Behavioral Science 2021	-2022	
Post-docs supervised	Hongseok Namkoong, Columbia Business School	2019	
Internship Mentor	Jerry Lin, Stanford University	2019-2020	
	Hongzi Mao, MIT	2019	
	Wilson Cai, University of California Berkeley	2018	
	Karthik Rajkumar, Stanford University	2018	
	Soren Kunzel, University of California Berkeley	2017	
	Carlos Riquelme, Stanford University	2016	
	Drew Dimmery, New York University	2015	
	Emmma Tosch, University of Massachusetts Amherst	2015	
	Rene Kizilcec, Stanford University	2013-2014	
	Joseph Davin, Harvard University	2013	
	Sean Taylor, New York University	2012	
	Solomon Messing, Stanford University	2012	
Thesis Committee	Sam Daulton, Oxford University	Present	

2021
2020