Ben Chugg

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Research Interests

- Sequential analysis and anytime-valid inference (game-theoretic statistics, supermartingales, e-values, sequential and post-hoc hypothesis testing)
- Concentation of random processes
- Applications to algorithm and experimental design (online learning, bandits, A/B testing)

Education

2022– Ph.D. in Machine Learning and Statistics, Carnegie Mellon University
Advisor: Aaditya Ramdas.

2022-24 MS in Machine Learning, Carnegie Mellon University

2018–19 M.Sc. in Mathematics (MFoCS), Oxford University
Advisor: Renaud Lambiotte. Distinction.
Thesis: The Graph-Simplex Correspondence and its Algorithmic Foundations.

2014–18 B.Sc. in Mathematics and Computer Science. University of British Columbia
Thesis advisor: William Evans. Combined Honours with Distinction.
Thesis: A Model for Computing in Dynamic, Resource-Limited Environments.

Selected Experience

Sum' 2024	Research Intern, Centrum Wiskunde & Informatica (CWI)	Amsterdam, Netherlands
2021–2022	Lead Research Analyst, RegLab, Stanford Law School	Stanford, USA
2019–2021	Research Fellow, RegLab, Stanford Law School	Stanford, USA
Sum' 2018	Research Intern, RIKEN Center for Advanced Intelligence Project	Tokyo, Japan
Spring 2018	Visiting Researcher, AUB Center for Advanced Mathematical Sciences	Beirut, Lebanon
2016–2017	NSERC Research Assistant, UBC Algorithms Lab	Vancouver, Canada

Publications

Published or accepted journal papers

(j.6) Ben Chugg, Hongjian Wang, Aaditya Ramdas. Time-uniform confidence spheres for means of random vectors. *Transactions on Machine Learning Research.* 2025.

(j.5) Ben Chugg, Hongjian Wang, Aaditya Ramdas. A unified recipe for (time-uniform) PAC-Bayes bounds. *Journal of Machine Learning Research*, 2023.

(j.4) Caleb Robinson, Ben Chugg, Brandon Anderson, Juan M. Lavista Ferres, Daniel E. Ho. Mapping Industrial Poultry Operations at Scale with Deep Learning and Aerial Imagery. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing.* 2022.

(j.3) Ben Chugg*, Brandon Anderson*, Seiji Eicher, Sandy Lee, Daniel E. Ho. Enhancing Environmental Enforcement with Near Real-Time Monitoring: Likelihood-Based Detection of Structural Expansion of Intensive Livestock Farms. *Journal of Applied Earth Observation and Geoinformation.* 2021

(j.2) Ben Chugg*, Lisa Lu*, Derek Ouyang*, Benjamin Anderson, Raymond Ha, Alexis D'Agostino, Anandi Sujeer, Sarah L. Rudman, Analilia Garcia, Daniel E. Ho. Evaluation of Allocation Schemes of COVID-19 Testing Resources in a Community-Based Door-to-Door Testing Program. *Journals of the American Medical Association, Health Forum.* 2021.

(j.1) Ben Chugg, William Evans, Kelvin Wong. Simultaneous Visibility Representations of Undirected Pairs of Graphs. *Journal of Computational Geometry.* 2021.

Full-length, peer-reviewed conference papers

N.B: Conference papers are the norm in CS/ML. Workshop papers are omitted.

(c.9) Ben Chugg, Santiago Cortes-Gomez, Bryan Wilder, Aaditya Ramdas. Auditing Fairness by Betting. *Neural Information Processing Systems.* 2023. Spotlight

(c.8) Ben Chugg, Peter Henderson, Jacob Goldin, Daniel E. Ho. Entropy Regularization for Population Estimation. *AAAI Conference on Artificial Intelligence.* 2023. Oral

(c.7) Peter Henderson, Ben Chugg, Brandon Anderson, Kristen Altenburger, Alex Turk, John Guyton, Jacob Goldin, Daniel E. Ho. Integrating Reward Maximization and Population Estimation: Sequential Decision-Making for Internal Revenue Service Audit Selection. *AAAI Conference on Artificial Intelligence.* 2023. Oral

(c.6) Ben Chugg,* Nicolas Rothbacher,* Alex Feng, Xiaoqi Long, Daniel E. Ho. Detecting Environmental Violations with Satellite Imagery in Near Real Time: Land Application Under the Clean Water Act. *Conference on Information and Knowledge Management.* 2022.

(c.5) Peter Henderson*, Ben Chugg*, Brandon Anderson, Daniel E. Ho. Beyond Ads: Sequential Decision-Making Algorithms in Law and Public Policy. *ACM Symposium on Computer Science and Law.* 2022.

(c.4) Hooman Hashemi, Ben Chugg, Anne Condon. Composable Computation in Leaderless, Discrete Chemical Reaction Networks. *International Conference on DNA Computing and Molecular Programming.* 2020.

(c.3) Ben Chugg, William Evans, Kelvin Wong. Simultaneous Visibility Representations of Undirected Pairs of Graphs. *Canadian Conference on Computational Geometry.* 2020.

(c.2) Ben Chugg, Takanori Maehara. Submodular Stochastic Probing with Prices. *International Conference on Control, Decision, and Information Technologies.* 2019.

(c.1) Ben Chugg, Anne Condon, Hooman Hashemi. Output-Oblivious Stochastic Chemical Reaction Networks. *International Conference on Principles of Distributed Systems.* 2018.

Preprints

(p.3) Ben Chugg, Aaditya Ramdas. A variational approach to dimension-free self-normalized concentration. 2025.

(p.2) Ben Chugg, Tyron Lardy, Aaditya Ramdas, Peter Grünwald. On admissibility in post-hoc hypothesis testing. 2025.

(p.1) Justin Whitehouse, Ben Chugg, Diego Martinez-Taboada, Aaditya Ramdas. Mean estimation in smooth Banach spaces under infinite variance and martingale dependence. 2024.

Miscellaneous articles

(m.3) Ben Chugg, Daniel E. Ho. Reconciling Risk Reduction and Prevalence Estimation in Public Health Using Batched Bandits. *NeurIPS Machine Learning in Public Health.* 2021. Oral

(m.2) The graph-simplex correspondence and its algorithmic foundations. *M.Sc. thesis, Oxford.* 2019.

(m.1) A model for computing in dynamic, resource-limited environments. *B.Sc. Thesis, UBC.* 2018.

Selected Awards

2022-2025 NSERC Postgraduate Scholarship–Doctoral (PGS D)

2022-2025	NSERC Graduate Scholarship–Doctoral (CGS D) (Declined)
2018	Mona Leith Memorial Scholarship
2018	Percy Walter Perris Scholarship
2018	Undergraduate Teaching Assistant Award (Computer Science)
2017	Shirley Snelgrove and John Yule Scholarship
2017	NSERC USRA for research in stochastic reaction networks
2016	NSERC USRA for research in graph theory
2014-2018	University of British Columbia Dean's list
2014	University of British Columbia Chancellor Scholar

Teaching

Teaching Assistant

2025	10-607: Computational foundations for machine learning, CMU
2025	10-606: Mathematical foundations for machine learning, CMU
2024	10-800: Game-theoretic probability, statistics and learning, CMU
2017, 2018	CPSC 420/500: Advanced algorithm design and analysis, UBC
2017	CPSC 320: Intermediate algorithm design and analysis, UBC
2017	CPSC 221: Basic algorithms and data structures, UBC

Talks

2025	On admissibility in post-hoc hypothesis testing	SAVI, Chennai
2024	Time-uniform confidence spheres.	CWI, Amsterdam
2023	Entropy Regularization for Population Estimation.	AAAI, Online
2021	Batched Bandits for Public Health	NeurIPS ML4PH, Online
	Artificial Intelligence for Clean Water	Sci-Pol Conf, Online
2020	Composable Computation in Leaderless, Discrete CRNs.	DNA, Online
	Simultaneous Visibility Representations of Undirected Pairs of Graphs.	CCCG, Online
2019	The Graph-Simplex Correspondence.	Mathematical Institute, Oxford
	Submodular Stochastic Probing with Prices.	CODIT, Paris
	Output-Oblivious Stochastic Chemical Reaction Networks.	OxCSC, Oxford
2018	Output-Oblivious Stochastic Chemical Reaction Networks.	OPODIS, Hong Kong
2017	Unconstrained Submodular Maximization in MapReduce.	CUCSC, Toronto

Reviewing

Electronic Journal of Statistics (2023-), NeurIPS

Other

Tools	LaTeX, Python, PyTorch, TensorFlow 2, GCP, Azure, Bash, GEE, Matlab, R, C++, Java
Citizenship	Canadian
Linguistics	Fluent in English (Native) and French. Awarded the DELF (Diplôme d'études en langue française) certificate in 2012.
Misc.	Better with a hacky-sack than you'd think.