Ben Chugg

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Education

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

2018–19 **M.Sc. in Mathematics** (MFoCS), University of Oxford
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

2021–2022	Lead Research Analyst, RegLab, Stanford Law School	Stanford, USA
2019–2021	Research Fellow, RegLab, Stanford Law School	Stanford, USA
2018	Research Intern, RIKEN Center for Advanced Intelligence Project	Tokyo, Japan
2018	Visiting Researcher, AUB Center for Advanced Mathematical Sciences	Beirut, Lebanon
2016–2017	NSERC Research Assistant, UBC Algorithms Lab	Vancouver, Canada

Selected Awards

2022-2024	NSERC Postgraduate Scholarship–Doctoral (PGS D)
2022-2024	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

Papers

Refereed Conference Proceedings

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

(c.7) Oral — 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.

(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) Journal invite Hooman Hashemi, Ben Chugg, Anne Condon. Composable Computation in Leaderless, Discrete Chemical Reaction Networks. *26th International Conference on DNA Computing and Molecular Programming*. 2020.

(c.3) Journal invite 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. *6th International Conference on Control, Decision, and Information Technologies*. 2019.

(c.1) Ben Chugg, Anne Condon, Hooman Hashemi. Output-Oblivious Stochastic Chemical Reaction Networks. *22nd International Conference on Principles of Distributed Systems*. 2018.

Refereed Journal Papers

(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.

Workshop Papers and Preprints

(p.1) Ben Chugg, Hongjian Wang, Aaditya Ramdas. A unified recipe for (time-uniform) PAC-Bayes bounds. 2023.

(w.3) Spotlight 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. *ICML Workshop on Adaptive Experimental Design in the Real World*. 2022.

(w.2) Oral Ben Chugg, Daniel E. Ho. Reconciling Risk Reduction and Prevalence Estimation in Public Health Using Batched Bandits. *NeurIPS Workshop on Machine Learning in Public Health*. 2021

(w.1) Peter Henderson*, Ben Chugg*, Brandon Anderson, Daniel E. Ho. Beyond Ads: Sequential Decision-Making Algorithms in Public Policy. *NeurIPS Workshop on Causal Inference Challenges in Sequential Decision Making: Bridging Theory and Practice*. 2021.

Teaching

Teaching Assistant

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

2023 **Entropy Regularization for Population Estimation**. AAAI 2023, DC, USA.
2021 **Reconciling Risk Reduction and Prevalence Estimation in Public Health Using Batched Bandits.** Machine Learning in Public Health, NeurIPS. Online.
Artificial Intelligence for Clean Water. Science-Policy Confluence Conference, Online.
2020 **Composable Computation in Leaderless, Discrete CRNs.** DNA 26, Online.
Simultaneous Visibility Representations of Undirected Pairs of Graphs. CCCG, Online.
2019 **The Graph-Simplex Correspondence**. Mathematical Institute, Oxford, UK
Submodular Stochastic Probing with Prices. CODIT, Paris, France.
Output-Oblivious Stochastic Chemical Reaction Networks. OxCSC, Oxford, UK.
2018 **Output-Oblivious Stochastic Chemical Reaction Networks**. OPODIS, Hong Kong, China.
2017 **Unconstrained Submodular Maximization in MapReduce**. CUCSC, Toronto, Canada.

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.