

# Ben Chugg

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## Education

- 2022– **Ph.D. Machine Learning**, Carnegie Mellon University  
Advisor: Aaditya Ramdas
- 2018–19 **M.Sc. Mathematics** (MFoCS), University of Oxford  
Distinction. Advisor: Renaud Lambiotte. Thesis: The Graph-Simplex Correspondence and its Algorithmic Foundations.
- 2014–18 **B.Sc. Mathematics and Computer Science**, University of British Columbia  
Combined Honours with Distinction. Advisor: William Evans. Thesis: A Model for Computing in Dynamic, Resource-Limited Environments.

## Selected Experience

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|-----------|--|-------------------|
| 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 chemical 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

## Publications

### Refereed Conference Papers

- (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. *26th 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. *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, Tech Reports, 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.