

# Ben Chugg

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## Education

- 2022–  
2018–19 **Ph.D. Machine Learning**, Carnegie Mellon University  
**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, <a href="#">RegLab, Stanford Law School</a>                 | Stanford, USA     |
| 2019–2021 | Research Fellow, <a href="#">RegLab, Stanford Law School</a>                       | Stanford, USA     |
| 2018      | Research Intern, <a href="#">RIKEN Center for Advanced Intelligence Project</a>    | Tokyo, Japan      |
| 2018      | Visiting Researcher, <a href="#">AUB Center for Advanced Mathematical Sciences</a> | Beirut, Lebanon   |
| 2016–2017 | NSERC Research Assistant, <a href="#">UBC Algorithms Lab</a>                       | 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 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.

### Refereed Conference Papers

- (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.

### Workshop Papers, Tech Reports, and Preprints

- (p.1) Ben Chugg, Peter Henderson, Jacob Goldin, Daniel E. Ho. [Entropy Regularization for Population Estimation](#). *Preprint*. 2022.
- (w.3) 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*. **Spotlight Talk**. 2022.
- (w.2) 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*. **Lightning Talk**. 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

- 2021 **Reconciling Risk Reduction and Prevalence Estimation in Public Health Using Batched Bandits**. Machine Learning in Public Health, NeurIPS. Online.
- 2021 **Artificial Intelligence for Clean Water**. Science-Policy Confluence Conference, Online.

2020 **Composable Computation in Leaderless, Discrete CRNs.** DNA 26, Online.  
2020 **Simultaneous Visibility Representations of Undirected Pairs of Graphs.** CCCG, Online.  
2019 **The Graph-Simplex Correspondence.** Mathematical Institute, Oxford, UK  
2019 **Submodular Stochastic Probing with Prices.** CODIT, Paris, France.  
2019 **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

*Technical 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.