Trevor D. J. Campbell

Citizenship: Canada, Netherlands

CONTACT INFORMATION

Work address:
Department of Statistics
3182 Earth Sciences Building
University of British Columbia
Vancouver, BC V6T 1Z4, Canada

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EDUCATION AND ACADEMIC POSITIONS

UNIVERSITY OF BRITISH COLUMBIA — 2023-Present
Associate Professor
Department of Statistics

UNIVERSITY OF BRITISH COLUMBIA — 2018-2023
Assistant Professor
Department of Statistics

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — 2016-2018
Postdoctoral Associate
Computer Science and Artificial Intelligence Laboratory (CSAIL)
Institute for Data, Systems, and Society (IDSS)
Supervisor: Professor Tamara Broderick
Research Focus: automated, scalable Bayesian inference; Bayesian nonparametrics; exchangeability; streaming data

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — 2013-2016
Doctor of Philosophy (Ph.D.), Machine Learning and Statistics
Laboratory for Information and Decision Systems (LIDS)
Supervisor: Professor Jonathan P. How
Thesis Title: Truncated Bayesian Nonparametrics
Cumulative GPA: 5.0/5.0

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — 2011-2013
Master of Science (S.M.), Aeronautics and Astronautics
Laboratory for Information and Decision Systems (LIDS)
Supervisor: Professor Jonathan P. How
Thesis Title: Multiagent Planning with Bayesian Nonparametric Asymptotics
Cumulative GPA: 5.0/5.0

UNIVERSITY OF TORONTO — 2007-2011
Bachelor of Applied Science (B.A.Sc.), Engineering Science, Honours with High Distinction
Major in Aerospace Engineering
Cumulative GPA: 3.93/4.0

PUBLICATIONS

SUBMITTED FOR REVIEW

- N. Surjanovic, S. Syed, A. Bouchard-Côté, **T. Campbell**. "Uniform ergodicity of parallel tempering with efficient local exploration." Available at arXiv:2405.11384.
- **T. Campbell**. "General bounds on the quality of Bayesian coresets." Available at arXiv:2405.11780.
- A. Bouchard-Côté, **T. Campbell**, G. Pleiss, N. Surjanovic. "MCMC-driven learning." Available at arXiv:2402.09598.
- N. Surjanovic, M. Biron-Lattes, P. Tiede, S. Syed, **T. Campbell**, A. Bouchard-Côté. "Pigeons.jl: Distributed sampling from intractable distributions." Available at arXiv:2308.09769.

BOOKS

- T. Timbers, **T. Campbell**, M. Lee. "Data Science: A First Introduction." CRC Press, 2022. Available online at `https://datasciencebook.ca`.
- T. Timbers, **T. Campbell**, M. Lee, J. Östblom, L. Heagy. "Data Science: A First Introduction with Python." CRC Press, 2024. Available online at `https://python.datasciencebook.ca`.

PAPERS

- M. Biron-Lattes, **T. Campbell**, A. Bouchard-Côté. "Automatic regenerative simulation via non-reversible simulated tempering." Journal of the American Statistical Association (accepted), 2024+.
- N. Chen, **T. Campbell**. "Coreset Markov chain Monte Carlo." International Conference on Artificial Intelligence and Statistics, 2024 (accepted) **(27% acceptance)**.

- M. Biron-Lattes*, N. Surjanovic*, S. Syed, **T. Campbell**, A. Bouchard-Côté. "autoMALA: Locally adaptive Metropolis-adjusted Langevin algorithm." International Conference on Artificial Intelligence and Statistics, 2024 (accepted) **(27% acceptance)**.
- G.C. Diluvi, B. Bloem-Reddy, **T. Campbell**. "Mixed variational flows for discrete variables." International Conference on Artificial Intelligence and Statistics, 2024 (accepted) **(27% acceptance)**.
- S. Winter, **T. Campbell**, L. Lin, S. Srivastava, D. Dunson. "Emerging directions in Bayesian computation." Statistical Science 39(1), 62–89, 2024.
- Z. Xu, **T. Campbell**. "Embracing the chaos: analysis and diagnosis of numerical instability in variational flows." Advances in Neural Information Processing Systems (accepted), 2023 **(26% acceptance)**.
- B. Zwartsenberg, A. Ścibior, M. Niedoba, V. Lioutas, Y. Liu, J. Sefas, S. Dabiri, J. W. Lavington, **T. Campbell**, F. Wood. "Conditional permutation invariant flows." Transactions on Machine Learning Research, 2023.
- Z. Xu, N. Chen, **T. Campbell**. "MixFlows: principled variational inference via mixed flows." International Conference on Machine Learning, 2023 **(28% acceptance)**.
- C. Naik, J. Rousseau, **T. Campbell**. "Fast Bayesian coresets via subsampling and quasi-Newton refinement." Advances in Neural Information Processing Systems, 2022 **(26% acceptance) (oral)**.
- N. Chen, Z. Xu, **T. Campbell**. "Bayesian inference via sparse Hamiltonian flows." Advances in Neural Information Processing Systems, 2022 **(26% acceptance) (oral)**.
- N. Surjanovic, S. Syed, A. Bouchard-Côté, **T. Campbell**. "Parallel tempering with a variational reference." Advances in Neural Information Processing Systems, 2022 **(26% acceptance)**.
- **T. Campbell**, S. Syed, C. Yang, M. Jordan, T. Broderick. "Local exchangeability." Bernoulli 29(3), 2084–2100, 2023.
- M. Biron-Lattes, A. Bouchard-Côté, **T. Campbell**. "Pseudo-marginal inference for CTMCs on infinite spaces via monotonic likelihood approximations." Journal of Computational and Graphical Statistics 32(2), 513–527, 2023.
- Z. Xu, **T. Campbell**. "The computational asymptotics of Gaussian variational inference and the Laplace approximation." Statistics and Computing 32(63), 2022.
- T. Horel, L. Masoero, R. Agrawal, D. Roithmayr, **T. Campbell**. "The Chicago Police Department dataset." Neural Information Processing Systems Track on Datasets and Benchmarks, 2021. Available at `https://github.com/chicago-police-violence/data`.
- X. Li, **T. Campbell**. "Truncated simulation and inference in edge-exchangeable networks." Electronic Journal of Statistics 15(2), 5117–5157, 2021.
- B. Beronov, C. Weilbach, F. Wood, **T. Campbell**. "Sequential core-set Monte Carlo." Uncertainty in Artificial Intelligence, 2021.
- S. Syed*, V. Romaniello*, **T. Campbell**, A. Bouchard-Côté. "Parallel tempering on optimized paths." International Conference on Machine Learning, 2021 **(20% acceptance)**.
- D. Cai*, **T. Campbell***, T. Broderick. "Finite mixture models do not reliably learn the number of components." International Conference on Machine Learning, 2021 **(20% acceptance)**.
- S. Amini Niaki, E. Haghighat, **T. Campbell**, A. Poursartip, R. Vaziri. "Physics-informed neural network for modelling the thermochemical curing process of composite-tool systems during manufacture." Computer Methods in Applied Mechanics and Engineering 384, 2021.
- D. Manousakas, Z. Xu, C. Mascolo, **T. Campbell**. "Bayesian pseudocoresets." Advances in Neural Information Processing Systems, 2020 **(20% acceptance)**.
- P. Zhu, A. Bouchard-Côté, **T. Campbell**. "Slice sampling for general completely random measures." Uncertainty in Artificial Intelligence, 2020.
- J. Huggins, M. Kasprzak, **T. Campbell**, T. Broderick. "Validated variational inference via practical posterior error bounds." International Conference on Artificial Intelligence and Statistics, 2020.
- **T. Campbell**, B. Beronov. "Sparse variational inference: Bayesian coresets from scratch." Advances in Neural Information Processing Systems, 2019 **(21% acceptance)**.
- **T. Campbell**, X. Li. "Universal boosting variational inference." Advances in Neural Information Processing Systems, 2019 **(21% acceptance)**.
- J. Huggins, **T. Campbell**, M. Kasprzak, T. Broderick. "Scalable Gaussian process inference with finite-data mean and variance guarantees." International Conference on Artificial Intelligence and Statistics, 2019. **(32% acceptance)**
- R. Agrawal, **T. Campbell**, J. Huggins, T. Broderick. "Data-dependent compression of random features for large-scale kernel approximation." International Conference on Artificial Intelligence and Statistics, 2019. **(32% acceptance)**
- **T. Campbell**, T. Broderick. "Automated scalable Bayesian inference via Hilbert coresets." Journal of Machine Learning Research 20(15):1–38, 2019.
- **T. Campbell**, T. Broderick. "Bayesian coreset construction via greedy iterative geodesic ascent." International Conference on Machine Learning, 2018. **(long oral, 9%)**
- **T. Campbell**, D. Cai, T. Broderick. "Exchangeable trait allocations." Electronic Journal of Statistics 12(2), 2290–2322, 2018.
- **T. Campbell***, J. Huggins*, J. How, T. Broderick. "Truncated random measures." Bernoulli 25(2), 1256–1288, 2019.
- **T. Campbell**, B. Kulis and J. P. How. "Dynamic clustering algorithms via small-variance analysis of Markov chain mixture models." IEEE Transactions on Pattern Analysis and Machine Intelligence 41(6), 1338–1352, 2019.
- J. Straub*, **T. Campbell***, J. P. How, J. W. Fisher III. "Efficient global point cloud alignment using Bayesian nonparametric mixtures." IEEE Conference on Computer Vision and Pattern Recognition, 2017. **(spotlight, 8% acceptance)**
- J. Huggins, **T. Campbell**, T. Broderick. "Coresets for scalable Bayesian logistic regression." Advances in Neural Information Processing Systems, 2016 **(22% acceptance)**.
- D. Cai, **T. Campbell**, T. Broderick. "Edge-exchangeable graphs and sparsity." Advances in Neural Information Processing Systems, 2016 **(22% acceptance)**.

- **T. Campbell**, J. Straub, J. W. Fisher III, and J. P. How. "Streaming, massively parallel variational inference for Bayesian nonparametrics." Advances in Neural Information Processing Systems, 2015 **(22% acceptance)**.
- J. Straub, **T. Campbell**, J. P. How and J. W. Fisher III. "Small-variance nonparametric clustering on the hypersphere." IEEE Conference on Computer Vision and Pattern Recognition, 2015. **(oral, 3% acceptance)**
- **T. Campbell** and J. P. How. "Bayesian nonparametric set construction for robust optimization." American Control Conference, 2015.
- **T. Campbell** and J. P. How. "Approximate decentralized Bayesian inference." Uncertainty in Artificial Intelligence, 2014. **(32% acceptance)**
- **T. Campbell**, M. Liu, B. Kulis, J. P. How, and L. Carin. "Dynamic clustering via asymptotics of the dependent Dirichlet process mixture." Advances in Neural Information Processing Systems, 2013. **(25% acceptance)**
- **T. Campbell**, L. Johnson and J. P. How. "Multiagent allocation of Markov decision process tasks." American Control Conference, 2013.
- **T. Campbell**, R. H. Klein, A. Geramifard and J. P. How. "Simultaneous clustering on representation expansion for learning multimodel MDPs." Reinforcement Learning and Decision Making, 2013.

Workshop Papers

- D. Cai*, **T. Campbell***, T. Broderick. "Power posteriors do not reliably learn the number of components in a finite mixture." NeurIPS I Can't Believe It's Not Better Workshop, 2020 (oral spotlight & Didactic Award).
- D. Cai, **T. Campbell**, T. Broderick. "Finite mixture models are typically inconsistent for the number of components." NeurIPS Workshop on Advances in Approximate Bayesian Inference, 2017.
- M. Shiffman, W. Stephenson, G. Schiebinger, **T. Campbell**, J. Huggins, A. Regev, T. Broderick. "Probabilistic reconstruction of cellular differentiation trees from single-cell RNA-seq data." NeurIPS Workshops on Advances in Approximate Bayesian Inference and Machine Learning in Computational Biology, 2017.
- **T. Campbell**, D. Cai, T. Broderick. "A paintbox representation of exchangeable trait allocations." NeurIPS Workshop on Practical Bayesian Nonparametrics, 2016.
- D. Cai, **T. Campbell**, T. Broderick. "Paintboxes and probability functions for edge-exchangeable graphs." NeurIPS Workshop on Adaptive and Scalable Nonparametric Methods in Machine Learning, 2016.

Book Reviews and Discussions

- **T. Campbell**, T. Broderick. Discussion of "Sparse graphs using exchangeable random measures." Journal of the Royal Statistical Society B, 79:5, 1295–1366, 2017.
- **T. Campbell**, T. Broderick. Review of "Handbook of mixed membership models and their applications." Book Reviews, Journal of the American Statistical Association, 111:516, 1840–1851, 2016.

Awards &
Talks

Grants/Awards

- 2024 OER Excellence and Impact Award (https://open.ubc.ca/oer-award/)
- 2023 PIMS/UBC Mathematical Sciences Early Career Award (https://www.pims.math.ca/pims-glance/prizes-awards)
- 2023 Oracle for Research Cloud Grant (co-PI with A. Bouchard-Côté)
- 2023 NSERC CREATE (co-Applicant with F. Wood (PI), B. Bloem-Reddy, A. Bouchard-Côté, K. Leyton-Brown, D. Poole, M. Schmidt, L. Sigal, D. Sutherland, M. van de Panne, K. M. Yi)
- 2023 UBC Data Science Institute Postdoctoral Matching Fund (co-PI w/ D. Sutherland)
- 2023 UBC Open Educational Resources Implementation Grant (PI)
- 2021 Blackwell-Rosenbluth Award (https://j-isba.github.io/blackwell-rosenbluth.html)
- 2021 Google Gift: Perception Academic Funding
- 2020, 2021, 2022 UBC AMS OER Champion (https://open.ubc.ca/oer-champions/)
- 2020 NSERC Alliance (co-Applicant with R. Ng (PI), R. Vaziri, F. Wood)
- 2020 NSERC Research Tools & Instruments (co-Applicant with F. Wood (PI), K. Leyton-Brown, L. Sigal, M. Schmidt)
- 2020 UBC Skylight Equipment Grant (PI)
- 2020 CIFAR AI Catalyst (co-Applicant with F. Wood (PI), B. Bloem-Reddy, A. Bouchard-Côté)
- 2019 SSHRC New Frontiers in Research – Exploration (co-Applicant with T. Huan (PI), M. Guhn)
- 2019 NSERC Discovery Grant and Launch Supplement (PI)
- 2016 SBSS Student Paper Award
- 2012 GNC Best Presentation in Session
- 2011 Natural Science and Engineering Research Council of Canada CGS-M Research Fellowship
- 2011 James D. Todd Memorial Scholarship
- 2010 Kenneth Sullivan / Pratt Whitney Canada Scholarship
- 2009 Natural Science and Engineering Research Council of Canada Undergraduate Summer Research Award
- 2008 Engineering Science Research Opportunity Program Scholarship
- 2007 Faculty of Applied Science and Engineering Admissions Scholarship
- 2007 Governor General's Bronze Medal

Plenary/Keynote Talks

- 2021 CAIDA Open House Seminar: Parallel Tempering on Optimized Paths
- 2019 UBC/SFU Joint Student Seminar: How to Explain Things

- 2024 ISBA / Fusion joint meeting: Making variational inference work for statisticians
- 2024 International Society for Bayesian Analysis World Meeting: General bounds on the quality of Bayesian coresets
- 2024 Statistical Society of Canada Conference: Uniform ergodicity of parallel tempering
- 2024 PIMS/UBC Mathematical Sciences Early Career Award Colloquium: Bayesian Inference for Big Data
- 2024 CRM Québec Mathematical Sciences Colloquium: Ergodicity of Parallel Tempering
- 2023 CMStatistics: Coreset Markov chain Monte Carlo
- 2023 Simon Fraser University Statistics and Actuarial Science Seminar: Bayesian Inference for Big Data
- 2023 ICIAM Minisymposium on Data Reconstruction and Sparsification: Bayesian coresets
- 2023 ISI World Statistics Congress: MixFlows
- 2023 Centre International de Rencontres Mathématiques Meeting (Approximate Bayes): Analysis of error in numerically unstable variational flows
- 2023 FlatIron Institute Reading Group: MixFlows
- 2023 BayesComp: MixFlows
- 2023 BayesComp Approximate Bayesian Computation Satellite: Sparse Variational Flows
- 2022 Centre International de Rencontres Mathématiques Meeting (Bayesian Fusion): Ergodic Variational Flows
- 2022 Joint Statistical Meetings: Sparse Hamiltonian Flows
- 2022 Invited Poster Session, Joint Statistical Meetings: Sparse Hamiltonian Flows
- 2022 Canadian Statistical Sciences Institute Cross-Country Tour: Sparse Hamiltonian Flows
- 2022 Statistical Society of Canada Conference: Creating Open Resources for an Introductory Data Science Course
- 2022 Bayesian, Fiducial, and Frequentist Conference: Sparse Hamiltonian Flows
- 2022 Cambridge MRC Biostatistics Unit Seminar: Sparse Hamiltonian Flows
- 2022 Boston University Department of Mathematics and Statistics Seminar: Sparse Hamiltonian Flows
- 2022 Google BayesFlow Group Seminar: Sparse Hamiltonian Flows
- 2021 Banff International Research Station (BIRS) Meeting on Foundations of Objective Bayesian Methodology: Parallel Tempering on Optimized Paths
- 2021 Banff International Research Station (BIRS) Data Science in Action: Parallel Tempering on Optimized Paths
- 2021 Junior Bayes Beyond Borders (JB^3): Parallel Tempering on Optimized Paths
- 2021 International Society for Bayesian Analysis Invited Session: The Computational Asymptotics of Gaussian Variational Inference
- 2021 UBC/UW Statistics Seminar: Parallel Tempering on Optimized Paths
- 2021 UC Santa Cruz Department of Statistics Seminar: Parallel Tempering on Optimized Paths
- 2021 Statistical Society of Australia (Bayes Section): Parallel Tempering on Optimized Paths
- 2021 UBC Institute of Applied Mathematics Colloquium: Probabilistic Model Summaries for Bayesian Inference
- 2020 CMStatistics: Sparse Variational Inference
- 2020 Northwest Data Science Seminar Series: Sparse Variational Inference
- 2020 Boeing Seminar: Reliable Data Analysis & Decision-Making
- 2019 CMStatistics: Universal Boosting Variational Inference
- 2019 MIFODS MIT Workshop on Exchangeability and Graphical Models: Local Exchangeability
- 2019 International Society for Bayesian Analysis East Asia Chapter: Universal Boosting Variational Inference
- 2019 Lancaster University Seminar: Learning via Data Compression
- 2019 Cambridge University Seminar: Learning via Data Compression
- 2019 University of Washington Data Science Summit: Turning Big Data into Small Data
- 2018 Allerton Conference on Communication, Control, and Computing: Greedy Iterative Geodesic Ascent
- 2018 Joint Statistical Meetings: Bayesian Coresets
- 2018 Boston Bayesians: Bayesian Coresets
- 2017 Banff International Research Station: Bayesian Coresets
- 2017 Conference on Bayesian Nonparametrics: Exchangeable Trait Allocations

CONTRIBUTED TALKS

- 2021 Bayesian Inference in Stochastic Processes: Local Exchangeability
- 2020 Joint Statistical Meetings: Sparse Variational Inference
- 2019 Joint Statistical Meetings: Universal Boosting Variational Inference
- 2019 Bayesian Nonparametrics Conference: Local Exchangeability
- 2018 International Conference on Machine Learning: Bayesian Coresets
- 2018 International Society for Bayesian Analysis: Bayesian Coresets
- 2017 International School and Conference on Network Science: Edge-exchangeable Networks
- 2017 Computer Vision and Pattern Recognition: Global Point Cloud Alignment
- 2016 Joint Statistical Meetings: Truncated Random Measures
- 2012 AIAA Guidance, Navigation and Control: Bayesian Nonparametrics

CONSULTANT

- Paliare Roland Rosenberg Rothstein LLP
- AMBImi Technology Services Inc.
- Atimi Software Inc.

PROFESSIONAL COMMITTEE

- Chair 2020: Junior Section of the International Society for Bayesian Analysis (jISBA)
- Chair-Elect 2019: Junior Section of the International Society for Bayesian Analysis (jISBA)
- Member: ISBA Professional Conduct Committee (2019-2022)

ORGANIZING & SCIENTIFIC COMMITTEE

- International Society for Bayesian Analysis World Meeting (ISBA) 2024: Scientific Committee
- NeurIPS 2021 Workshop: Your Model is Wrong: Robustness and Misspecification in Probabilistic Modeling
- Bayesian Young Statisticians Meeting (BAYSM) 2022: Organizing & Scientific Committee
- Bayesian Young Statisticians Meeting: Online (BAYSM:O) 2020: Organizing Committee
- ISBA 2020 Invited Session: Variational Inference for Statisticians: Advances in Methods and Foundations *(postponed to 2021 due to COVID-19)*
- JSM 2020 Topic-Contributed Session: Junior Research in Methods for Integrating Heterogeneous Data
- JSM 2019 Invited Session: Scaling up Bayesian inference for massive datasets
- JSM 2019 Topic-Contributed Session: Advances in Bayesian Nonparametric Methods and Its Applications
- JSM 2019 Topic-Contributed Session: Believable Big Bayes: Large-Scale Bayesian Inference with Finite-Data Guarantees
- NeurIPS 2018 Workshop: All of Bayesian Nonparametrics (Especially the Useful Bits)
- NeurIPS 2016 Workshop: Practical Bayesian Nonparametrics

SENIOR AREA CHAIR

- 2024: Advances in Neural Information Processing Systems (NeurIPS)

ACTION EDITOR/AREA CHAIR/ASSOCIATE EDITOR/SENIOR PROGRAM COMMITTEE

- 2023–present: Transactions on Machine Learning Research (TMLR)
- 2019: Artificial Intelligence and Statistics (AISTATS)
- 2021, 2023: Advances in Neural Information Processing Systems (NeurIPS)
- 2019: Uncertainty in Artificial Intelligence (UAI)

REVIEWER

- Neural Information Processing Systems (NeurIPS)
- Artificial Intelligence and Statistics (AISTATS)
- International Conference on Machine Learning (ICML)
- International Conference on Learning Representations (ICLR)
- Journal of Neurocomputing
- Journal of Aerospace Information Systems (JAIS)
- American Controls Conference (ACC)
- AIAA Conference on Guidance, Navigation and Control (GNC)
- International Conference on Intelligent Robots and Systems (IROS)
- Computational Statistics and Data Analysis (CSDA)
- Electronic Journal of Statistics
- Journal of Machine Learning Research (JMLR)
- NeurIPS Workshop for Women in Machine Learning (WiML)
- NeurIPS Workshop on Advances in Approximate Bayesian Inference
- NeurIPS Workshop on Bayesian Nonparametrics: The Next Generation

AWARD COMMITTEE

- 2023 ISBA Savage Award (Theory & Methods) Committee
- 2023 UBC Spring Graduate Awards Committee
- 2020 ISBA Savage Award (Theory & Methods) Committee

- 2022 Blackwell-Rosenbluth Award Committee
- 2017 SBSS Student Paper Award Committee

SOFTWARE DEVELOPER

- ShorTeX (LaTeX style file for efficient typesetting): `https://github.com/trevorcampbell/shortex`
- Rudaux (course management system): `https://github.com/ubc-dsci/rudaux`
- Dictauth (password authentication with JupyterHub) : `https://github.com/ubc-dsci/dictauth`
- Autotest (autograding software): `https://github.com/ubc-dsci/autotest`. Merged upstream into Jupyter NbGrader as of Aug 2023. See `https://github.com/jupyter/nbgrader/pull/1817`.
- Pigeons.jl (Bayesian inference via parallel tempering): `https://pigeons.run` and `https://github.com/julia-tempering/pigeons.jl`
- Website Diff (website diffs): `https://github.com/trevorcampbell/website_diff`

TEACHING &
SUPERVISION

COURSE INSTRUCTION

- Spring 2024 – DSCI100: Introduction to Data Science
- Fall 2022 – STAT520B: Variational Bayes
- Fall 2022 – DSCI100: Introduction to Data Science
- Fall 2021 – DSCI100: Introduction to Data Science
- Spring 2021 – DSCI553: Statistical Inference and Computation II (Bayes)
- Spring 2021 – STAT520B: Variational Bayes
- Fall 2020 – STAT538A: Generalized Linear Models
- Fall 2020 – DSCI100: Introduction to Data Science
- Spring 2020 – DSCI553: Statistical Inference and Computation II (Bayes)
- Spring 2020 – DSCI100: Introduction to Data Science
- Fall 2019 – DSCI100: Introduction to Data Science
- Fall 2018 – STAT547P: Bayesian Nonparametrics

RESEARCH SUPERVISION

- 2024, Ugrad – Yujia Ma (co. Alex Bouchard-Côté)
- 2024-cur., M.Sc. – Ivy Liu
- 2022-cur., Ph.D. – Naitong Chen
- 2021-2022, Postdoc – Kamyar Gordnian (co. Reza Vaziri)
- 2021-2022, Postdoc – Berend Zwartsenberg (co. Frank Wood)
- 2021-cur., Ph.D. – Nikola Surjanovic (co. Alex Bouchard-Côté)
- 2021-cur., Ph.D. – Gian Carlo Diluvi (co. Benjamin Bloem-Reddy)
- 2020-cur., Ph.D. – David Xu
- 2020-2022, M.Sc – Naitong Chen
- 2019-2021, M.Sc – Gian Carlo Diluvi (co. Benjamin Bloem-Reddy)
- 2019-2021, Postdoc – Sina Amini-Niaki (co. Reza Vaziri)
- 2019, UGrad – Naitong Chen
- 2019, UGrad – Hayden McTavish
- 2018-cur., Ph.D. – Xinglong Li
- 2018-2024, Ph.D. – Miguel Biron-Lattes (co. Alex Bouchard-Côté)
- 2018-2020, M.Sc – David Xu
- 2018-2020, M.Sc – Gary Zhu (co. Alex Bouchard-Côté)

OTHER SUPERVISION

- Summer 2022, Python DSCI100 translation – Navya Dahiya, Gloria Ye
- Summer 2024, R DSCI100 worksheets AutoTest conversion – Moira Renata

OTHER

- Spring 2017, Teaching Assistant, MIT – 6.882: Bayesian Modeling and Inference
- Spring 2017, Guest Lecturer, MIT – A Whirlwind Tour of ML: Bayesian Methods
- 2009-2010, Facilitated Study Group Leader, U of T – ECE150: Circuit Analysis, CSC192: Computer Programming

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OTHER RELEVANT
EXPERIENCE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY   2011-2016
Doctoral Research
Supervisor: Professor Jonathan P. How
Research focused on statistical inference and approximations for Bayesian nonparametric models with streaming, distributed data. Major research contributions include truncated approximations for normalized and unnormalized completely random measures, approximate variational techniques for both parametric and nonparametric streaming, distributed inference, fast low-variance asymptotic Bayesian nonparametric clustering algorithms, and statistically-designed uncertainty sets for robust linear optimization.

PDT PARTNERS, LLC   Summer 2015
Summer Research Associate
Conducted quantitative market research.

UNIVERSITY OF TORONTO INSTITUTE FOR AEROSPACE STUDIES   Spring 2011
Undergraduate Thesis Research
Supervisor: Professor Phillipe Lavoie
Research focused on dielectric barrier discharge plasma actuators for flow control over airfoils. Created computational engine for simulating the creation, absorption and transport processes of the plasma that occurs around the actuators. Developed a new initial condition for plasma actuator simulations based on solutions of the Laplace equation on a rectangular domain, with a focus on optimizing the relaxation time of such simulations.

UNIVERSITY OF TORONTO INSTITUTE FOR AEROSPACE STUDIES   Summer 2009
Summer Research Project
Supervisor: Professor Timothy Barfoot
Research focused on the use of LiDAR intensity images for lighting-invariant vision-based localization in mobile robotics. Created a 3D odometry package for the research group using data from wheel odometry sensors and an inertial measurement unit. Ran experiments in decentralized state estimation of groups of robots, laser ranger point cloud stitching, and optimization of next viewpoint for environment mapping.

UNIVERSITY OF TORONTO DEPARTMENT OF PHYSICS   Summer 2008
Summer Research Project
Supervisor: Professor Henry van Driel
Research focused on surface plasmon polaritons on gold and silver surface gratings. Programmed a finite difference time domain computational simulation engine for Maxwell's equations in 2D environments.

HILL & SCHUMACHER PATENT & TRADEMARK AGENTS   Summers 2010-2011
Patent Agent Assistant
Supervisors: Lynn Schumacher, Ph.D. and Nancy Hill, LL.B.
Performed all aspects of patent prosecution. Under the supervision of two patent agents, met with clients to discuss their inventions, drafted full patent applications, provisionals, divisionals, continuations-in-part, and Patent Cooperation Treaty (PCT) applications for those inventions, and responded to office actions from the government. Performed these duties for Canadian, American, European, and Japanese jurisdictions.