Olivier Binette | CV

143 2e Avenue, Montréal, Qc, Canada, H4G 2W2

+1 (418) 922-1294 • olivier.binette@gmail.com
olivierbinette.ca

Background in mathematics, statistics and computation, with particular ease in research and creative work. Currently pursuing a research Master's Degree in Mathematics.

Research Interests

Bayesian and nonparametric statistics, posterior consistency, information inequalities, topological consistency.

Education

2017–2019 **M. Sc. in Mathematics** (4.3/4.3)
Université du Québec à Montréal
Thesis: Bayesian Nonparametrics for Directional Statistics (Advisor: Prof. Simon Guillotte).

2014–2017 **B. Sc. in Mathematics** (4.2/4.3)
Université du Québec à Montréal

Awards

2017–2018 Alexander-Graham-Bell **NSERC**[1] Master's Award (17 500$)
2017–2019 **FRQNT**[2] Master's Award (30 000$)
2017 **NSERC** Undergraduate Research Award (5 625$) + FRQNT Supplement (2 000$)
2016 **NSERC** Undergraduate Research Award (5 625$) + FRQNT Supplement (2 000$)

Publications

Binette, O. (2019). A Note on Reverse Pinsker Inequalities. *IEEE Transactions on Information Theory* (to appear).

Binette, O. (2018). Topologie et apprentissage machine. *Notes from the Margin. (13)* p. 5–6. (Expository paper targeted at graduate students in mathematics.)

Preprints

Binette, O. et Guillotte, S. (2018). Bayesian Nonparametrics for Directional Statistics. *arXiv:1807.00305*. Submitted to the Journal of Statistical Planning and Inference.

Posters

Binette, O. & Coache, A. The Significance of the Adjusted R Squared. (Bio)Statistics Research Day. Montréal (Canada). September 21, 2018.

Binette, O. Classification and Topology, or Consequences of Sobolev Consistency. Canadian Statistics Student Conference. June 2, 2018.

Binette, O. et Guillotte, S. Bayesian Nonparametrics for Directional Statistics. 11th Conference on Bayesian Nonparametrics. Paris (France). June 26, 2017.

[1] Natural Sciences and Engineering Research Council of Canada
[2] Fonds de recherche du Québec – Nature et technologies (Québec Research Fund - Nature and Technologies)

Talks

Invited

MLBytes Speaker Series (Duke University): Classification and Topology. North Carolina (United States). November 15, 2018.

Texas A&M University Nonparametrics Group: On Bayesian Nonparametric Estimation of Discontinuous Densities. Texas (United States). November 1, 2018. Invited by Professor Debdeep Pati.

Université du Québec à Montréal: A Circular Analogue to the Bernstein Polynomial Densities, Bayesian Nonparametrics and Large Support Asymptotics. Montréal (Canada). October 4, 2018. Invited by Professor Jean-François Coeurjolly.

Sherbrooke University: A Circular Analogue to the Bernstein Polynomial Densities. Sherbrooke (Canada). March 29, 2018. Invited by Professor Taoufik Bouezmarni.

Contributed

Graduate Student Seminar - UQAM: Computing the Hausdorff Alpha-Entropy. Montréal (Canada). July 24, 2018.

Statistics Society of Canada Annual Meeting: A Circular Analogue to the Bernstein Polynomial Densities. Montréal (Canada). June 4, 2018.

Mathematical Sciences Institute's Student Conference: Topology and Machine Learning. Sherbrooke (Canada). May 25, 2018.

Probability and Statistics Student Seminar - UQAM: Information, Likelihood and Divergence. Montréal (Canada). May 17, 2018.

Graduate Student Seminar - UQAM: Infinite Dimensional Probabilities. Montréal (Canada). December 4, 2017.

Mathematical Congress of the Americas: Bayesian Learning. Montréal (Canada). July 28, 2017.

Canadian Undegraduate Mathematics Conference: Bayesian Learning. Montréal (Canada). July 23, 2017.

Probability and Statistics Student Seminar - UQAM: Constructive Approximation. Montréal (Canada). May 25, 2017.

Academic Work Experience

2017–Now **Teaching Assistant at Université du Québec à Montréal**
Statistics I, Probability II, Analysis I & II, Analysis and Algebra for the Actuarial Sciences, Complex Analysis
Animation of weekly problem-solving sessions for classrooms of 10 to 80 students.

Summer 2017 **Research Internship with Prof. Simon Guillotte**
Bayesian Nonparametrics for Directional Statistics.
Co-wrote the paper *Bayesian Nonparametrics for Directional Statistics* and presented our results in a poster at the 11th Bayesian Nonparametrics Conference in Paris. Collaborated with Prof. Debdeep Pati from Texas A&M to help finalize the paper *Bayesian Closed Surface Fitting Through Tensor Products* (corrections and answers to reviewer comments). Investigated the constructive approximation of compact hypersurfaces and wrote the short paper *Topologie et apprentissage machine* as an application.

Summer 2016 **Research Internship with Prof. Simon Guillotte**
Bayesian Nonparametrics for Directional Statistics.
Developed new models for the (Bayesian nonparametric) statistical analysis of non euclidean data, demonstrated key theoretical properties and obtained new results on posterior asymptotics in the context of estimating discontinuous densities supported on compact metric spaces.

Summer 2015 **Research Internship with Prof. Simon Guillotte**
Introduction to Gaussian Processes and Bayesian Nonparametrics

Leadership

- Strong proponent of inclusivity and respect in education and research. Past Ambassador of the undergraduate Mathematics Program at UQAM. I actively helped students in need through mentoring and by bringing in appropriate resources when required.
- Organizer of UQAM's Probability and Statistics Student Seminar during the 2016 and 2017 summers. The dozen conferences stimulated research and brought together students in this field.
- Co-organizer of the Statistics Student Summit in Montréal (March 2019; `http://sesam2019.ca`).
- Co-organizer of UQAM's Graduate Student in Mathematics Seminar (2018-2019).
- Member of UQAM's Graduate Mathematics Programs Committee, where I represent student interests relative to graduate program structures (2017-2019).
- Co-organized an activity for children on behalf of the *Institut des Sciences Mathématiques* (ISM) at the Montréal Science Center (summer 2018).

Skills

Communication: Strong communication and oral presentation skills. Presented research talks at national conferences and at universities. Experience writing successful scholarship applications and project proposals, writing papers and reports.

Programming: Knowledge of R, Python, C/C++, Java, Matlab, Mathematica, Javascript. Experience with the development of large object-oriented program architectures (in Java).

Scientific computing: Experience with multithreading and parallelization for scientific computing and large scale simulation studies (mostly in C, Java and Javascript).

Organization: Experience organizing and publicizing various events and seminars.