Anthony Coache | CV

Saint-Jean-sur-Richelieu, Québec – Toronto, Ontario
+1 (514) 946-9661 • anthony.coache@gmail.com • anthonycoache.ca
acoache

Education

2019 – ... **PhD in Statistics**
University of Toronto
Thesis: Risk-Sensitive Reinforcement Learning With Dynamic Risk Measures (Advisor: Prof. Sebastian Jaimungal).

2017 – 2019 **M.Sc. in Mathematics, Concentration in Statistics** (4.3/4.3)
Université du Québec à Montréal
Thesis: Stochastic Portfolio Optimization under Coherent Risk Measures (Advisors: Prof. François Watier, Prof. René Ferland).

2014 – 2017 **B.Sc. in Mathematics, Concentration in Statistics** (4.18/4.3)
Université du Québec à Montréal

Scholarships & Awards

2019 – 2022 **NSERC** [1] Alexander Graham Bell Doctoral's Award (105 000$)
2019 – 2023 **FRQNT** [2] Doctoral Scholarship (84 000$)
2017 – 2018 **NSERC** Alexander Graham Bell Master's Award (17 500$)
2017 – 2019 **FRQNT** Master's Award (30 000$)
2017 **NSERC** Undergraduate Research Award + **FRQNT** Supplement (7 125$)
2017 **Faculty of Sciences** Honorable Mention for my Bachelor of Science
2016 **NSERC** Undergraduate Research Award + **FRQNT** Supplement (7 125$)
2015 – 2016 **Dean's Honour List** for Winter 2015, Fall 2015, Winter 2016 and Fall 2016 terms
2014 **UQAM Foundation** Admission Scholarship of the Faculty of Sciences (2 000$)

Research Interests

Reinforcement Learning, Risk-Sensitive RL, Stochastic Modeling, Computer Science, Risk Measures, Optimization, Applied Statistics, Statistical Learning.

Publications

Papers

◦ **Coache, A.** & Jaimungal, S. Reinforcement Learning with Dynamic Convex Risk Measures. *arXiv*. 2021.

Posters

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

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

- **Coache, A.** & Larose, F. "Do schools kill creativity?" Well, they help analyze popularity! *Annual Meeting of the SSC*, Montréal. June 4, 2018.
- Ferland, R., Froda, S. & **Coache, A.** Comparison of surveillance flu data across regions. *Annual Meeting of the SSC*, Winnipeg. June 12, 2017.

Projects

- Bilodeau, B. & **Coache, A.** Methods for Adding Explicit Uncertainty to Deep Q-Learning. *Research Topics in Statistical Machine Learning*, UofT. April 14, 2021.

Talks

Invited

- *World Congress of the Bachelier Finance Society:* Reinforcement Learning for Dynamic Risk Measures. Hong Kong. June 15, 2022.
- *Oxford-Man Institute Workshop:* Optimising a Dynamic Conditional Value-at-Risk over Policies using Conditional Elicitability. Oxford (UK). May 6, 2022.
- *SIAM Conference on Financial Mathematics and Engineering:* Reinforcement Learning with Dynamic Convex Risk Measures. Online. June 1, 2021.

Contributed

- *Research Topics in Statistical Machine Learning at UofT:* Distilling Policy Distillation. Online. March 18, 2021.
- *ACTSCI / MAFI Research meeting at UofT:* Risk-Sensitive Optimization in Reinforcement Learning. Online. January 28, 2021.
- *Annual Meeting of the SSC:* Stochastic Algorithms for Solving a Multiperiod Quantile-Based Portfolio Optimization Problem. Calgary. May 27, 2019.
- *Probability and Statistics Student Seminar at UQAM:* Non-Parametric Estimation of the Quantile Function. Montréal. July 13, 2017.

Work Experience

2022 **Academic Visitor at University of Oxford**
Reinforcement Learning and Conditional Elicitability.
Invited by Prof. Álvaro Cartea. Conducted research on reinforcement learning at the Oxford-Man Institute during a 6 month period. Joint work with Prof. Sebastian Jaimungal.

2020 – ... **Teaching Assistant at University of Toronto**
Statistical Consultation, Communication and Collaboration (STA490Y), Dependence Modelling (STA4528), Data Science for Risk Modeling (STA2536)
In charge of project meetings for groups of 4-5 students, individual mentoring sessions, grading assignments and weekly exercises tutorials for classrooms of 50 students.

- Fall 2021: STA2536
- Winter 2021: STA4528
- Fall 2020: STA490Y

2020 **Research Assistant with Prof. Sebastian Jaimungal**
Goodness-of-Fit, Order-Flow and Hedging.
Collaboration between Oanda and Fields-CQAM. Investigated hidden trends in tick count and order-flow trading data. Explored hedging strategies with dynamic barriers using hidden Markov models.

2016 – 2019 **Teaching Assistant at Université du Québec à Montréal**

Regression (STT2120), Statistical Software Laboratory (STT2100), Statistical Methods for the School of Management (MAT2080), ANOVA for Biology (MAT1285)
In charge of weekly exercises sessions for classrooms of 10 to 40 students.

- Winter 2019: STT2120 & MAT1285
- Fall 2018: STT2100 & MAT2080
- Winter 2018: STT2120 & MAT2080 (2x)
- Fall 2017: STT2100 & MAT2080
- Fall 2016: MAT2080

Summer 2017 **Research Internship with Prof. François Watier**
Stochastic Optimization with Convex Risk Measures.
Studied stochastic optimization methods. Investigated the single-period and multi-period portfolio optimization problems with convex risk measures.

April 2017 **Research Internship with Prof. Sorana Froda and Prof. René Ferland**
Estimation of parameters from surveillance data on past epidemics.
Familiarized myself to epidemiology. Programmed R and SAS scripts for data analysis and visualization. Led to a contribution in a poster.

2017 – 2019 **Mathematics Tutor**
Quantitative Analysis in Psychology (PSY4031)
Preparation of lessons and weekly exercises sessions for individual tutoring.

Summer 2016 **Research Internship with Prof. François Watier**
Monte Carlo Evaluation of Sensitivities for Risk Measures.
Programmed Harrell-Davis and kernel density estimation algorithms. Developed confidence intervals for risk measures and sensitivities. Joint work with Prof. René Ferland.

Leadership

- Part of the program committee for the ACM International Conference on AI in Finance, responsible for reviewing regular papers during the double-blind peer-reviewed process. (November 2021 and 2022)
- Prepared and ran a Matlab bootcamp (Winters of 2021 and 2022) and Python bootcamp (September 2022) for students of the Masters of Financial Insurance program at UofT.
- Co-organized the Canadian Statistics Student Conference 2020 (May 2020) and 2021 (June 2021), both held online due to the COVID-19. Part of the translation team, responsible for translating all content that was published in the program booklet, as well as all communications with students.
- Contributed on a professional development guide aimed at UQAM's Math & Stats majors (Winter 2019).
- Co-organized the first Statistics Student Summit in Montréal (March 2019).
- Volunteered for the organization of the R in Montréal seminar (July 2018).
- Promoted the UQAM's Probability and Statistics Student Seminar (Summers of 2016 and 2017).
- Co-creator and main administrator of the Facebook page UQAM Statistics (September 2016), to bring Statistics students together and keep them informed about upcoming events within the department.
- Co-organized orientation activities for new undergraduate students in Statistics (2016 – 2019).

Skills

Programming: Strong knowledge of R, Python, Matlab and TeX/LaTeX. Knowledge of C/C++, SAS, Java and SQL.

Multitasking: Experience carrying out several projects in parallel from start to finish.

Versatility: Worked on multiple interdisciplinary projects related to statistics, mathematics, finance and epidemiology. Particular ease in creative work and fast learning.

Organization: Experience organizing and publicizing various events and seminars.