Anthony Coache | CV

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Education

2019 – ... **PhD in Statistics** (3.95/4.0)
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 Sensitivity, Stochastic Modeling, Computer Science, Risk Measures, Optimization, Applied Statistics, Statistical Learning.

Publications

Papers

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

Posters

- Binette, O. & **Coache, A.** (2018) The Significance of the Adjusted R Squared. *(Bio)Statistics Research Day*, Montréal.
- **Coache, A.** & Larose, F. (2018) "Do schools kill creativity?" Well, they help analyze popularity! *Annual Meeting of the SSC*, Montréal.
- Ferland, R., Froda, S. & **Coache, A.** (2017) Comparison of surveillance flu data across regions. *Annual Meeting of the SSC*, Winnipeg.

Projects

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

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

Talks

Invited

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

Contributed

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

Work Experience

2022 **Academic Visitor at University of Oxford**
Reinforcement Learning and Conditional Elicitability.
Invitation by Prof. Álvaro Cartea from 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.

- 2021: STA2536 & STA4528
- 2020: STA490Y

2020 **Research Assistant with Prof. Sebastian Jaimungal**
Hidden trends in order-flow trading data and hedging with dynamic barriers.
Collaboration between Oanda and Fields-CQAM.

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.

- 2019: STT2120 & MAT1285
- 2018: STT2100, STT2120 & MAT2080 (3x)
- 2017: STT2100 & MAT2080
- 2016: MAT2080

Summer 2017 **Research Internship with Prof. François Watier**
Stochastic optimization in multi-period 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.

2017 – 2019 **Mathematics Tutor**
Weekly individual tutoring for Quantitative Analysis in Psychology (PSY4031)

Summer 2016 **Research Internship with Prof. François Watier and Prof. René Ferland**
Monte Carlo evaluation of sensitivities for risk measures.

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 (January 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.
- Contributed on a professional development guide aimed at UQAM's Math & Stats majors (April 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 (2016 – 2017).
- Co-creator and main administrator of the Facebook page UQAM Statistics (2016 – 2019).
- 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.