PATRICK NADEEM WARD

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STATEMENT OF PURPOSE

I'm currently a Master's student in Computer Science at McGill University/Mila working under the supervision of Prof. Doina Precup at Mila and the RLLab. My research interests are broadly focused on the fields of Reinforcement Learning and Deep Learning as a means for representing and learning complex systems for decision making.

EDUCATION

Master's Degree Computer Science *Sept 2018 - Expected April 2020*
McGill University

- Cumulative GPA 4.0/4.0 — Advisor: Prof. Doina Precup
- Graduate Research Award (2018) to puruse a Master's in Computer Science at McGill

Bachelor's Degree Double major Mathematics and Software Engineering *Sept 2015 - April 2018*
McGill University

- Cumulative GPA 3.6/4.0
- Distinction Award for being in the top 25% of the graduating class.

EXPERIENCE

Research Assistant *June 2018 - Present*
Mila/RLLab at McGill University

- Conducting a survey of the tradeoffs of various Temporal Differencing (TD) methods in the tabular setting by gathering empirical data on grid environments. The ultimate goal of this project would be to better understand the sample complexity required in Reinforcement Learning through Regret or Probably Approximately Correct (PAC) style analysis.
- Exploring the use of new stochastic policies for continuous control tasks in Reinforcement Learning. By implementing recent advances in Variational Inference called Normalizing Flows we hope to be able to model more expressive policy distributions.

Teaching Assistant Intro to Reinforcement Learning, Applied Machine Learning and Real Analysis
McGill University *May - June 2019, Sept 2018 - Dec 2018, Dec 2016 - May 2017*

- Hosted Tutorials and held office hours to help students understand various topics in Reinforcement Learning, Machine Learning and Real Analysis. Graded class assignments, reports and tests.
- Set up a Kaggle competition for a class project to classify hand drawn images using a variation of Google's quick draw dataset.

Data Scientist Intern *May 2017 - Sept 2017*
Société Générale

- Fast prototyping of solution concepts to solve problems in banking and administration using machine learning techniques in Python:
  - Used Random Forests and various time-series models to predict potential server crashes.
  - Used NLP tools such as word and sentence embeddings to create a distance metric to flag legal documents that vary from acceptable standards and created a UI using Flask.
- Promoted and communicated the use of ML/A.I. in the workplace and their possible applications to other areas in the Bank.

PUBLICATIONS

P.N. Ward, A. Smofsky, A. J. Bose (2019) "Improving Exploration in Soft-Actor-Critic with Normalizing Flows Policies" Invertible Neural Networks and Normalizing Flows Workshop ICML 2019.

TECHNICAL SKILLS

- Programming Languages and tools: Python (3 years); Java (2 years); R, SQL, MATLAB, JavaScript, C, Hadoop, Git (1 year).

SELECTED COURSE WORK

- Courses in Stochastic Processing, Time-Series, Reinforcement Learning, Mathematical foundations of Machine Learning, Theoretical Principals of Deep Learning, Algorithmic Game Theory, Natural Language Processing, Real and Numerical Analysis among others.

ADDITIONAL INFORMATION

- Fluent in English, French and Arabic.
- US citizen