

Christopher Molloy, Ph.D.

Machine Learning & Quantitative Research

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EDUCATION

London School of Economics | *MSc. - Financial Mathematics* **Sept. 2024 - Present**

- Related Coursework: Black and Scholes Theory, Stochastic Processes, Derivatives

Queen's University | *Ph.D. - Machine Learning* **Sept. 2020 - Jul. 2024**

- Related Coursework: Data Mining, Deep Learning, Neural Networks.

Queen's University | *Bachelor of Computing & Mathematics* **Sept. 2016 - Apr. 2020**

- Related Coursework: Data Science, Regression, Time Series Analysis, Optimization and Bayesian statistics.

RECENT AWARDS

Postgraduate Scholarships Doctoral, NSERC: Awarded \$63,000 funding for quality and impact of research. 2023

Scholarship, Lab2Market: Awarded \$15,000 for entrepreneurship proposal on AI driven malware detection. 2023

Best Research Paper Award, IEEE CSR: €700 prize awarded by conference chairs for research contributions. 2022

RECENT EXPERIENCE

Ph.D. Machine Learning **Sept. 2020 - Jul. 2024**

Queen's University **Kingston, Canada**

- Developed Deep Learning model using TensorFlow to classify complex datasets of malware and demonstrated a 14% increase in performance compared to existing state-of-the-art.
- Conducted empirical experimentation on developed solution against existing state-of-the-art using statistical modelling and data analytics on > 1,000,000 data samples to prove the efficacy of the discoveries.
- Presented work at international conferences to non-technical stakeholders using Microsoft PowerPoint.

Portfolio Management Data Research Intern **Jan. 2024 - Apr. 2024**

RP Investment Advisors **Toronto, Canada**

- Designed an object-oriented Python framework for bond time series data preprocessing and visualization utilizing open-source technologies such as NumPy, pandas, and Plotly.
- Developed sequence-based neural network for bond misprice indication. Decreased error by 26% against industry baselines on a diverse set of bonds.
- Integrated AI insight system into the in-house market visualization platform using RESTful APIs for real-time updates.
- Effectively explained project results to the portfolio management and trading team, making the benefits of the technology clear and understandable to those with a fundamental analysis background.

Pentest Service Advisor Student **Sept. 2023 - Dec. 2023**

Scotiabank **Toronto, Canada**

- Independently designed and developed data cleaning pipeline improving on company standard for penetration test information storage database using Python, MySQL, and Pandas based on non-technical stakeholder needs.

SKILLS

Programming Languages Python (2 & 3), C++, C, R, Java, Bash, MySQL, MATLAB, \LaTeX , Unix, Linux, Windows.

Software & Libraries TensorFlow, PyTorch, NumPy, pandas, Plotly, scikit-learn, Git, Microsoft Office, Microsoft Azure.

Technical Reinforcement Learning, Statistical modeling, Algorithm trading, Communication to non-technical stakeholders.

Work Authorization Canada, United Kingdom, European Union.

SELECT PUBLICATIONS (1 OF 8)

C. Molloy, J. Banks, S. H. H. Ding, P. Charland, A. Walenstein and L. Li, "Adversarial Variational Modality Reconstruction and Regularization for Zero-Day Malware Variants Similarity Detection", in *Proceedings of the 2022 IEEE International Conference on Data Mining (ICDM)*, Orlando, FL, USA, 2022, pp. 1131-1136. **(Flagship conference in the domain of Data Mining)**.