Christopher Molloy, Ph.D.

Quantitative Researcher | Trading & Fixed-Income Strategies

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EDUCATION

London School of Economics | *MSc. - Financial Mathematics*
- Coursework: Stochastic Calculus, Credit Risk Modeling, No-arbitrage Pricing, Portfolio Construction.

Queen's University | *Ph.D. - Computer Science*
- Coursework: Bayesian statistics, Time Series Analysis, Data Mining, Deep Learning.
- Awards and Scholarships totalling $\$80,000$ for groundbreaking research.

Queen's University | *BSc (Hons) - Computer Science & Mathematics*
- Coursework: Probability Theory & Statistics, Optimization Methods, Regression.

WORK EXPERIENCE

Ph.D. Research Associate **Sept. 2020 - Jul. 2024**
Linna Research Lab **Kingston, Canada**
- Led an international research team with BlackBerry and DRDC to develop predictive systems for cybersecurity.
- Engineered ML models in Python, improving classification accuracy by 14% over industry benchmarks.
- Designed backtesting frameworks with 1M+ real-world samples to validate model robustness.
- Applied statistical modeling and data analytics to benchmark performance against state-of-the-art solutions.
- Presented findings to executives and technical stakeholders at international conferences.

Quantitative Research Analyst **Jan. 2024 - Apr. 2024**
RP Investment Advisors **Toronto, Canada**
- Engineered a cloud-based signal pipeline for thousands of corporate bonds to improve data quality.
- Enhanced credit risk and spread analysis to support fixed-income investing strategies.
- Built a bond pricing model in Python (TensorFlow) to detect market inefficiencies.
- Reduced prediction error by 26%, improving capital allocation and alpha generation.
- Partnered with portfolio managers to integrate quantitative insights into investment strategies.
- Combined quantitative research with discretionary decision-making to optimize investment performance.

Data Automation Analyst **Sept. 2023 - Dec. 2023**
Scotiabank **Toronto, Canada**
- Built a Python/MySQL data pipeline to automate Excel-based reporting workflows.
- Eliminated 100% of manual data handling, accelerating decision-making and accessibility for stakeholders.

PUBLICATIONS & RESEARCH

Volatility Arbitrage - Optiver
- Skills: Python, Risk-neutral Pricing, Data Mining, Yield Curve Construction, Hedging Strategies.
- Implemented market-making strategies in Python for high-frequency derivatives trading, identifying volatility arbitrage opportunities and ranking top 5 in LSE trading challenge based on PnL performance.

Similarity Detection
- Skills: Custom Backtesting pipeline, Tensorflow, Deep Learning, Scikit-learn, NumPy.
- Invented high accuracy (99%) system with applications in data analysis relevant to quantitative finance.
- Published in IEEE TSE (Journal Impact Factor: 6.5).

Heterogeneous Data
- Skills: Unstructured Data Handling, Multi-Modality Learning, Regime Classification, Pandas.
- Created a model with high performance (0.92 AUC) in identifying noisy data with applications in risk analysis.
- Published in IEEE ICDM (Flagship conference on data mining).

SKILLS

- **Quantitative Analysis & Trading** Statistical Arbitrage, Factor Modeling, Time-Series Forecasting, Portfolio Optimization (Mean-Variance, Black-Litterman), Alpha Research & Alternative Data.
- **Risk Management & Derivatives Modeling** Fixed-Income Pricing, Yield Curve Construction, Credit Spread Analysis, Risk-Neutral Pricing, Monte Carlo Simulations, Value at Risk (VaR), Hedging Strategies.
- **Programming & Data Science** Python (Advanced: Pandas, NumPy, Scikit-learn, TensorFlow), SQL, Unix/Linux, Backtesting (custom pipelines), Microsoft Excel, Cloud Infrastructure (Azure, AWS).