Alex Kazachek

☎ → (519) 319-2102
✉ → alexdkazachek@gmail.com
↗ → akazachek.com

Education

University of Waterloo & Institute for Quantum Computing — 2023 – Present
- MSc in Applied Mathematics (3.97/4.00)

University of Western Ontario — 2019 – 2023
- Honours BSc in Mathematics and Data Science (3.91/4.00)

Work

Algorithmic Trading Intern — May 2024 – Aug 2024
TD Securities
- Researched techniques for time series forecasting, particularly for mixed frequency channels (e.g. LSTMs, channel clustering, MIDAS). Passed to a random forest for directional predictions, with aims to create a factor-neutral overlay.
- Created an optimization procedure to facilitate internalization of hedges from other desks. Resulted in a factor-neutral hedge with less slippage.
- Developed an order book simulator to facilitate backtesting of liquidity-taking strategies and compiling statistics to lobby for changes at exchanges.
- Corporate action adjusted prices, and examined overnight holding horizons to optimize PnL and assess broker toxicity.

Quant Research Intern — May 2023 – Aug 2023
Ontario Teachers' Pension Plan
- Developed a statistical procedure to detect dislocations between time series.
- Applied the procedure to implied versus realized volatility series, resulting in a scalar incorporated during portfolio construction which reduces positions when high future volatility is projected.
- Position scalar implemented for 100+ assets, reducing overall drawdown with negligible impact on Sharpe and turnover. Involved creating bespoke implied volatility proxies for assets with illiquid options markets.

Mathematics Research Assistant — Sep 2022 – Apr 2023
University of Western Ontario
- Conducted mathematical physics research on coherent quantum states and their entanglement.

Publications

- G. Farhani, N. H. Dashtbayaz, A. Kazachek, B. Wang. "A simple remedy for failure modes in physics-informed neural networks." Under review at Neural Networks.
- T. Barron and A. Kazachek. "Coherent states and entropy." Proceedings of Geometric Science of Information, 2023.
- T. Barron and A. Kazachek. "Entanglement of mixed states in Kähler quantization." Proceedings of Lie Theory and its Applications in Physics, 2021.

Projects

Algorithmic Trading — Oct 2023 – Jan 2024
- Developed an algorithmic trading platform, handling all data processing and supporting multiple concurrent models with order netting.
- Ran an intraday equity long-short model using a signal-processing approach to measuring trend.

Awards

Canada Graduate Scholarship (Master's) — 2023 Academic Year
- Awarded Canada's largest and most competitive graduate scholarship, one of 48 recipients at Waterloo across all mathematical and physical sciences.

RBC Scholarship in Data Science — 2021 Academic Year
- Awarded by RBC Tech & Ops for accomplishments and potential in machine learning research.

Skills & Interests

Programming: Python (numpy, pandas, statsmodels, sklearn, pytorch, xgboost), SQL, R, MATLAB, Java, LaTeX
Interests: Beat Saber (top 10% in Canada), Scrabble, live music & festivals, travel (6 countries), reading, writing poetry