Alex Kazachek

www.akazachek.com • alexdkazachek@gmail.com • (519)-319-2102

Education

University of Waterloo
Sep 2023 – Present

MSc in Applied Mathematics.

Western University
Sep 2019 – Apr 2023

Honours BSc in Math & Data Science (3.91/4.00).

Awards

Canada Graduate Scholarship
2023 School Year

Awarded the largest and most competitive master's scholarship. Total of 48 awards given at Waterloo across all mathematical and physical sciences.

Mervin Wass Scholarship
2022 School Year

Selected by the Western math department as the most meritorious student.

RBC Data Science Scholarship
2021 School Year

Awarded by RBC Tech & Ops for accomplishments and potential in machine learning research.

Papers

T. Barron and A. Kazachek. "Coherent states and entropy." Proceedings of Geometric Science of Information, 2023.

G. Farhani, N. Dashtbayaz, A. Kazachek, and B. Wang. "A Simple Remedy for Failure Modes in PINNs." Submitted to NeurIPS 2023.

T. Barron and A. Kazachek. "Entanglement of mixed states in Kähler quantization." Proceedings of Lie Theory and Its Applications in Physics, 2021.

Interests

Speedcubing (personal best of 12.55 seconds).

Callisthenics and rock climbing.

Scrabble.

Work

TD Securities | Trading Associate Intern
May 2024 – Aug 2024

Projected to work on algorithmic strategies within Global Equity Derivatives.

Ontario Teachers' Pension Plan | Quant Research Intern
May 2023 – Aug 2023

Developed a statistical procedure to detect dislocations between time series.

Incorporated implied volatility (IV) into existing asset volatility estimation to add forward-looking insight. Designed IV proxies for assets with illiquid options markets.

Developed a risk control system, reducing positions when high future volatility is projected. Implemented for 100+ assets, reducing overall drawdown with negligible impact on Sharpe and turnover.

Western University | Research Assistant
Sep 2022 – Apr 2023

Conducted mathematical physics research on coherent quantum states and their entanglement.

Led to two publications and one presentation at an international conference.

Projects

Physics-Informed Neural Networks
Dec 2021 – May 2022

Studied the gradient flow of physics-informed neural networks (PINNs) under momentum-based optimizers.

Proved momentum diminishes spectral bias in PINNs relative to SGD. Experimentally demonstrated PDE boundary conditions are high-frequency features and learned slower.

Clubs

Math Club at Western (MaCAW) | Vice President
Sep 2020 – Aug 2022

Organized biweekly math contests, both creating and grading them.

Led student seminars, events for undergraduates to present their research and theses.