

ALEX CARR

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Education

Massachusetts Institute of Technology

July 2024 – Feb 2026

Master's in Financial Mathematics

Cambridge, MA

5.0 / 5.0 GPA (Math & CS) while **working full-time** | **Full merit scholarship** for academic excellence (top 1% of admits)

University of Edinburgh

(Gap Year 2022 - 23) Sept 2019 – May 2024

BSc in Economics with a secondary in Applied Mathematics

Edinburgh, UK

Top of cohort while working full-time | **Started** college a year **early** | Won 5 academic prizes, including the best thesis in economics

Relevant Courses (UoE and MIT): **PhD Econometrics**, **MSc Statistics**, **MSc Machine Learning Research** in Finance, **PhD Machine Learning**, **Deep Learning**, **MSc Financial Markets**, Quantitative Investment Management, Micro/Macroeconomics I & II

Professional Experience

Massachusetts Institute of Technology

Jan 2025 – Present

Quantitative Researcher

Cambridge, MA

- I was going to continue to a **PhD at MIT** in the intersection of **computer science**, mathematics, and finance, **motivating** several **research** positions with leading MIT professors working on improving modern machine learning techniques.
- Architected a **neural network** ingesting **US equity** universe observations, replacing a MSE loss function with a **novel differentiable quantile-risk loss** penalising anticipated VaR breaches to limit out-of-sample drawdowns to 5% (Prof. Chen).
- Supervised by Prof **Rothman** (Head of Stat Arb at **Millennium**) a **long/short** and factor-neutral **model** with a CNN structure, self-attention block, and reconstruction layer to achieve **1.31** out-of-sample **Sharpe** (Russell 1000) at 5% drawdowns.
- Engineered an **NLP script** that parses through **10mil+ articles**, and uses embedding methods to **detect** if a **technology** was a **surprise** to the world (e.g. DeepSeek) – used to measure if tech shocks impact global R&D (patent issuance & funding).

McKinsey & Co.

June 2022 – Sept 2023

Senior Business Analyst (03 - 09/2023) & Intern (06 - 09/2022)

Central Europe

- Worked **full-time** during a gap year and received a return offer for Senior Business Analyst (**6 months accelerated**).
- Built **full-stack valuation** suite (DCF, merger, and “break-up” scenarios) for a **\$15+ B** cross-border TMT **merger**, while crafting a defensive **stand-alone playbook** that preserved shareholder value under potential merge collapse risk and strong competition.
- Designed operations that **cut grid-connection lead-times 50%** for 3.5 M Eastern-European people through 15+ logistical, engineering, pricing tariff, and working-capital levers — blueprint was rolled out across the client's portfolio.

VinaCapital

Sept 2022 – February 2023

Quantitative Analyst & Macroeconomics Research Intern

Saigon, VN

- I was going to **graduate** college at **20/21**, which I felt was too early and left my youth unexplored – took a **gap year to study Vietnam** at its largest multi-strat fund under the 1:1 tutelage of Kokalari, who ran trading desks at JPM and Lehman Brothers.
- Modeled macroeconomic variables** (PCA, Kalman filters, VaRs, GARCH, tree methods): 2022 **GDP** growth and inflation (0.1 pp error), Vietnam's rice price (0.2 pp error), EM **FX** rates, or also developed measures of Asia's slow de-dollarization.
- Co-authored fortnightly **reports** on **macroeconomic** developments in Asia for the **Vietnamese Prime Minister**, ASEAN institutional investors, and the fund's investment division (e.g. modeled impacts of Vietnam's credit crunch on equities).

Finance Projects & Competitions

IMC (Prosperity 3 Competition)

April 2025

- Ranked **83/12 000+ teams (top 0.7%)** in Round 1 by building a real-time options-pricing engine (vectorised Black-Scholes solver & implied-volatility surface fitting) that processed > 100 k ticks in <1 s, enabling delta-hedged trades that drove profitability.

Transformer L/S Project (1.31 Sharpe)

March 2025

- Collected and cleaned > 250,000 data points** (e.g. merged data across correct PERMNOs, ensured point-in-time data, etc) on all the firms from the **Russell 1000** index from 2000 to 2024 (45 fundamental variables) using Bloomberg, LSEG, and WRDS.
- Achieved **1.31 Sharpe** out-of-sample (period: Jan 2020 to Dec 2024) using a model that uses a one-dimensional **CNN structure**, an **encoder** layer, a **self-attention** block, and a **reconstruction** layer to predict one-month returns.
- Ran a **Long/Short** strategy (top and bottom 20% with a one-month holding period), while being **factor neutral**, restricting position size to 2%, **limiting drawdowns** to 5% and annual volatility to 12%, and managing T-costs.

Macro-Finance: FX & Monetary Policy Event Studies

Jan 2025

- Following Lo & MacKinley (1988), conducted **OLS regression event studies** on the **impact** of central bank announcements, political scandal media announcements, and Vietnamese fiscal policy reveals on the **Vietnam Dong (VND)**.
- Found that SBV's **surprise 100-bp** rate **hikes** in Sep and Oct 2022 yielded largest cumulative abnormal moves (**4% CAR** over five trading days), confirming domestic-monetary shocks as the dominant driver of VND volatility during the 2022 stress period.

Competitive Debating, Maths & Additional Awards

Languages & Skills: Czech (native), English (native), Python, R, Stata, Julia, Bloomberg Terminal

Academic Awards: MIT Fellowship (top 1% admit), Top of Cohort and Best Thesis (Edinburgh), Czech National Recognition (3x)

Debating: Won global competitions during college, top 20 globally (2019), top 3 in Europe (2018), Czech champion (2018)

Mathematics: Full points in the regional round of the Czech Math Olympiad, progressing to the advanced rounds