

Thomas Cole

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EDUCATION

Columbia University, Graduate School of Arts and Science Sept. 2024 – Dec. 2025
Master of Arts, Mathematics of Finance CGPA: 3.9/4.0

- **Coursework:** Stochastic Processes, Time Series Analysis, Hedge Fund Strategies, Mathematical Finance, Computational Statistics

McGill University, Desautels Faculty of Management Sept. 2019 – May 2024
Bachelor of Commerce, Major in Mathematics, Minor in Finance CGPA: 3.8/4.0

- **Coursework:** Probability, Statistics, Linear Algebra, ODE's, PDE's, Calculus 1-4, Applied Quantitative Finance, Stochastic Processes, Investment Management

WORK EXPERIENCE

Graham Capital Management | *New York, New York* June 2025 – Aug. 2025
Incoming Summer Risk Analyst

TD Bank | *Toronto, Ontario* May 2024 – Aug. 2024
Analyst Intern, TBSM Hedge Strategy

- Analyzed time series data of mortgage commitment hedging performance, examining the impact of factors such as interest rate fluctuations and loan terms on the propensity to fund.
- Streamlined the data processing pipeline to enable real-time access to key performance metrics.
- Created an SQL script to parse a daily data feed of over 1 million mortgage records, analyzing funding status and attributes while ensuring efficient storage for historical comparison.

Analyst Intern, TBSM FO Investment Strategy and Analytics Jan. 2024 – May 2024

- Developed a Python package to support analytics for the front office investments team, automating daily and weekly reporting procedures for portfolios exceeding \$130B, significantly reducing turnaround time on ad-hoc requests.
- Led and prepared weekly team learning sessions, instructing the team on various aspects of Python development.

TD Securities | *Toronto, Ontario* May 2023 – Aug. 2023
Market Risk and Model Development Summer Associate

- Identified, analyzed and monitored various market risk measures such as FX Vega, Gamma, FX Notional and IR Delta for TDS's trading activity within Global FX, ensuring to escalate any issues in a timely manner.
- Prepared and presented daily and weekly summaries of GFX relevant risk metrics to senior leaders.

PROJECTS

Columbia University | *New York, New York* Sept. 2024 – Present
Student Research Analyst, Statistical Arbitrage using Clustering |

- Developed a systematic, market-neutral statistical arbitrage strategy by clustering equities based on their correlation matrix and applying K-means and graph algorithms such as spectral clustering.
- Optimized the number of clusters using the Marchenko-Pastur law and the explained variance threshold.
- Achieved an annualized return of 10% with a Sharpe ratio of 1.3, while effectively managing downside risk, achieving a Sortino ratio of 1.8.
- Utilized Python for data pre-processing, algorithm implementation, and cluster optimization.

McGill University | *Montreal, Quebec* Sept. 2023 – Dec. 2023
Student Research Analyst, PCA Applications on Implied Volatility Surfaces | [Github](#)

- Performed PCA on the Implied Volatility Surface of options on US equities listed in the S&P500 using Python.
- Conducted a simulation study to evaluate the effectiveness of various principal component selection methods, including traditional approaches and those based on random matrix theory.
- Efficiently processed 75GB+ of both price and implied volatility data for all equities in S&P500 over a multi-year period utilizing Python with scikit-learn, NumPy, Pandas, and Dask.
- Prepared a research report containing my results, necessary mathematics and visualizations.

SKILLS

Computer Skills: Python, R, Java, MATLAB, SQL, Tableau

Language Skills: English (Native), French (Intermediate)

Interests: Guitar, Computers, Personal Finance