Joshua Weekes

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EDUCATION

The University of Chicago **Chicago, IL**
Master of Science in Financial Mathematics **Expected December 2024**

- Courses: Portfolio & Risk Management, Python, Quantitative Trading Strategies, Stochastic Calculus, Fixed Income Derivatives, Numerical Methods, Advanced Computing in C++, Credit Markets, Credit Risk

Arizona State University, Barrett, The Honors College **Tempe, AZ**
Bachelor of Science in Physics; Bachelor of Science in Mathematics **May 2023**

- Courses: Real Analysis, Mathematical Statistics, Applied Partial Differential Equations, Advanced Linear Algebra, Probability Theory, Industry Tools for Data Science, Object Oriented Programming and Data
- Awards: *Cum Laude;* 2023 Physics Outstanding Undergraduate Researcher Award; Dean's List

SKILLS

Computing: Python, C++, SQL, MATLAB, Java, Git Bash, Tableau, Alteryx, Snowflake, Microsoft Office
Packages: PyTorch, QuantLib, Scikit-learn, Statsmodels, SciPy, Pandas, NumPy, Matplotlib, Seaborn
Knowledge: Financial markets, machine learning, principal component analysis, time series analysis
Trading Products: Equities, forwards, futures, options, interest rate swaps, credit default swaps, forex

EXPERIENCE

Neuberger Berman **Chicago, IL**
Quantitative Research Intern, Fixed Income **June 2024 – August 2024**

- Designed and implemented a full-stack reinforcement learning pipeline, from data preprocessing and model training to performance evaluation, enabling robust time series forecasting for trading decisions
- Developed an optimization algorithm to select and rank factors for municipal bond analysis, maximizing R^2 for a Weighted Constraint Least Squares regression model
- Created a suite of interactive visualizations in Tableau that provided portfolio managers with detailed breakdowns of exposure, factor returns, and total attributions, enabling data-driven investment decisions

Manteio Capital **Chicago, IL**
Quantitative Researcher – Project Lab, The University of Chicago **March 2024 – June 2024**

- Assembled a reinforcement learning encoder-only transformer model to make daily trading decisions between foreign currency pairs using prior returns, MACD, and RSI
- Implemented custom reward function classes based on financial performance metrics, including Sharpe, Sortino, Calmar, and Omega ratios, enabling evaluation of out-of-sample performance

Loomis, Sayles & Company **Chicago, IL**
Quantitative Researcher – Project Lab, The University of Chicago **January 2024 – March 2024**

- Derived entropy-based signals of the VIX and asset returns for detecting regime change and guiding strategy allocation using Python, enhancing market adaptability
- Built forecasting trading algorithm utilizing the custom entropy signal for equities, bonds, and foreign exchange leveraging parallel computing to optimize parameters through a grid search

SciHub Research Group **Tempe, AZ**
Research Specialist **June 2023 – September 2023**

- Optimized lens dye combinations for spectral transmission as a function of dye time, enhancing colorblind users' test scores from 0% with industry-leading glasses to 44% on clinical standard colorblindness test
- Supervised the development of a custom decision tree-based ML algorithm to accommodate colorblindness on a computer monitor resulting in a method superior to those developed by Apple, Microsoft, and Android

Research Associate **February 2021 – June 2023**

- Invented the case, circuitry, and firmware for a Bluetooth Portable Colorblindness Test; reduced time to diagnosis by 96% with a 96% agreement with the clinical standard for diagnosing colorblindness

ADDITIONAL EXPERIENCE

The University of Chicago, Master of Science in Financial Mathematics **Chicago, IL**
ETF Hedging Strategy Final Project **February 2024 – March 2024**

- Engineered a trading strategy to capture high dividends of BDCs at risk levels comparable to private credit by holding a BDC ETF and hedging with a collar on a replication of the ETF from a multivariate GARCH