Peichen (Ryan) Luo

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Education

The University of Chicago **Chicago, IL**
Master of Science in Financial Mathematics (GPA: 3.85/4.0) **Expected December 2024**

- **Courses**: Quantitative Trading Strategy, Machine Learning, Portfolio Credit Risk, Big Data, Stochastic Calculus, Option Pricing, Numerical Methods, Portfolio Theory & Risk Management, Computing for Finance, Time Series

Boston University **Boston, MA**
Bachelor of Arts in Mathematics and Economics (Major GPA: 3.90/4.0) **January 2023**

- **Courses:** Statistical Modeling, Machine Learning, Data Structures and Algorithms, Differential Equations, Probability Theory, Corporate Finance, Mathematical Statistics, Multivariable Calculus, Discrete Math, Point Process

Skills

Programming: Python, SQL, R, C++, MATLAB, Stata, MS Office, Power BI, SAS, Tableau, JMP, Plotly
Knowledge: Machine Learning, Algorithmic Trading, Financial Modeling, Statistical Modeling, NLP, Data Analytics, Time Series, Corporate Treasury, Econometrics, Financial Market, Risk Management, Option Pricing, Fixed Income

Work Experience

BMO U.S. **Chicago, IL**
Quantitative Analyst Intern **June 2024 - August 2024**

- Constructed a diverse range of machine learning models, including Logistic Regression, XGboost, Neural Network, and LSTM, to predict partial prepayment. Conducted Cross-validation and parameters search using a customized loss function
- Engineered pipelines to perform comprehensive data cleansing, normalization, and exploratory data analysis, followed by feature selection, modeling, and detailed performance analysis to ensure optimal data quality and model accuracy
- Visualized double partial dependence curves for key drivers, such as S-curves and WALA ramp against different HPA buckets to evaluate the performance across various cohorts, and refined parameters to further improve model performance
- Validated and backtested models to ensure reliable prediction for SMM. Tested the models for different stress scenarios and enhanced risk assessment for the aggregate level portfolio. Reached a 0.17% MAE in the randomly split OOS test

Cloud Quant **Chicago, IL**
Quantitative Researcher Intern - Project Lab **January 2024 - March 2024**

- Created methodologies and utilized machine learning models to predict whether a company will be added or removed from the S&P 500 by applying truthfulness scores from Deception and Truth Analytics along with other key drivers
- Generated trade signals based on the model's prediction along with other favorable matrices and designed a quantitative strategy. Constructed an investment portfolio and backtested its performance which reached a Sharpe ratio of 1.33
- Extracted trade-type information from options volume and Greeks to generate alpha opportunities on the underlying equity, especially focusing on institutional trade, liquidity, and order book imbalance

China Life Pension Company Limited **Shanghai, China**
Quantitative Researcher Intern **June 2023 – August 2023**

- Managed internal databases using SQL, developed 10+ custom factors based on market and fundamental data, visualized and evaluated their performance respectively by determining IC/IR values, Expected Return, and Vol. to gauge efficiency
- Constructed a smart beta strategy by selecting stocks based on their factor value, and utilized other favorable matrices like DY, Profitability, and MS to further adjust their weights, which achieved a 1.56 Sharpe Ratio over a 20-year OOS backtest
- Designed a robust backtesting mechanism in Python to evaluate trading strategies against the benchmark, making automated pipelines to conduct distribution analysis, performance analysis, and time series visualizations on the strategies

MechCraft Tech **New York, NY**
Quantitative Analyst Intern **April 2023 – May 2023**

- Utilized Freddie Mac and Fannie Mae loan-level data to develop and implement advanced machine learning models such as XGboost Classifier for the accurate prediction of mortgage credit risk. Aggregated and maintained the data using SQL
- Performed comprehensive data cleansing, visualization, Exploratory Data Analysis (EDA), and conducted feature selection on factors, such as Delinquency, FICO, Loan Purpose, and DTI, to identify drivers of default activity
- Implemented cross-validation to ensure model robustness, and evaluated model performance by employing ROC curve analysis and AUC metrics, with an 85% AUC, a 99% accuracy, and an 84% recall ratio in out-of-sample tests

Research

Quantitative US Stock Equity Research under Different Volatility Regimes **April 2022 – July 2022**

- Conducted in-depth correlation studies between Gold, VIX, and Stocks using Python. Uncovered the potential of VIX and Gold as predictive and hedging tools for the stock market. Crafted a volatility-centric trading strategy with 1.21 Sharpe