Yu-Ching (Joseph) Liao

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• Portfolio: https://drive.google.com/drive/folders/1pvzzG0jZkfcN05CahKE2CUW1SuTVHuG0?usp=drive_link

EDUCATION

University of Illinois at Urbana-Champaign, Grainger School of Engineering — **Champaign, Illinois**
Master of Science in Financial Engineering, GPA: 3.83/4.00 — Dec. 2023

- **Academic Excellence Award:** Best Academic Performance in 2022 Fall
- **2nd Place of Practicum Competition:** *Cross-exchange Pricing Model and Anomaly Detection for Crypto Markets*
- **CME Group: The Epic Equity Futures Trading Challenge 2023:** Top quartile based on final account value
- **CME Group: Crypto Futures and Options Trading Challenge 2023:** Top 84th out of 1608 players
- **Tau Beta Pi:** Member of Alpha Chapter

National Taiwan University of Science and Technology, School of Management — **Taipei, Taiwan**
Bachelor in Industrial Engineering (Operations Research); minor in Finance, GPA: 3.80/4.30 — Jun. 2021

- **Academic Excellence Award:** Best Academic Performance in 2020 Fall
- **Valedictorian for Graduation Ceremony**

TECHNICAL SKILLS

- Analytical: Python (Numpy, Pandas, Scipy, Stat-model, Scikit-Learn, Multiprocessing, Cython), R, Microsoft Excel (Vlookup, Pivot tables, Solver, Power Query) , VBA, SQL
- OOP: C++ (Gurobi)
- Finance: Bloomberg Terminal → Able to extract, preprocess, visualize and analyze complex time series financial data.

WORK EXPERIENCE

Baus Capital Partners LLC — **Miami, FL (Remote)**
Quantitative Researcher (Full-time) — Dec 2023 – Present

- **Research on Trading Strategies:**
  - **Machine Leaning based Statistical Arbitrage Strategy**: making use of Lasso Regression and Differential Evolution on Portfolio Optimization, resulting in out-sample alpha of 46 basis points on Mean Return, 4.5 on Sharpe Ratio and 7.3 on Sortino Ratio, weekly 74% of the Average AUM Usage
  - **Funding Rate Arbitrage Strategy**: resulting in out-sample average monthly return of 3.78%, 20.78 on Sharpe Ratio, daily 99.46% of the Average AUM Usage
  - **Machine Learning based Momentum Strategy**: made use of PCA, Lasso Regression and Differential Evolution on Portfolio Optimization, resulting in out-sample alpha of 5.5 basis points on Daily Mean Return, 4.02 on Sharpe Ratio and 6.46 on Sortino Ratio, weekly 63% of the Average AUM Usage

- **Supportive Research:**
  - Conducting the order execution time research, optimizing the order price adjustment process and improve the qualities of overall trading activities with implementing Cython.
  - Designed Conditional Probability Analyzer for identifying the potential price movement of specific asset from other indexes' movements and implemented it for filtering the signals for trading strategies
  - Designed Market Filtering Model with PCA and Decision Tree Classifier to identify the market condition and implemented it for filtering the signals for trading strategies
  - Designed Multi-Factor Risk Model for Risk Analysis, decompose the return series of the trading strategy to the components of risk exposures, obtaining the insights on the risks in terms of risk-factors return
  - Scripted the useful functions, such as add_profit_column, stoploss_takeprofit, for company, enhancing the conveniency and efficiency of all research tasks
  - Designed Signal Search Engine to generate the potential trading signals by optimizing on self-designed Health Score with Differential Evolution

Capital Securities Corporation — **Taipei, Taiwan**
Quantitative Trader (Intern) — May 2023 – Aug. 2023

- Built an index-replicating portfolio constructing model by applying Random Forest Feature Importance on components selection and Gradient Descent on weighting, reducing tracking error by 0.0018 basis points and number of components by 89%
- Devised the Momentum Long/Short Strategy with self-designed Electronic and Banking Index, resulting in 3.2 of Sharpe Ratio with 5 basis points of Maximum Drawdown on 5 years daily closing data
- Conducted weekly research by Python for managers to extract potential Beta, calculate the correlation between the PnL

of traded strategies, and test the robustness of strategies by calculating mean excess return and applying T-test
- Improved the FX reopening rate speculation model by applying Wavelet Denoising and Python Linear Regression, resulting in an 88% increase of accuracy
- Developed Python-based ETF Analyzer Software for generating the heatmap of Correlation and Hedge Ratio of selected ETFs by extracting real-time data from SQL Database, reducing the process time from 3 minutes to 2 seconds

Tower Research Capital **New York, NY (Remote)**
Project Topic: ***Cross-exchanges Pricing Model and Anomaly Detection for Crypto Markets*** Jan. 2023 – Jun. 2023
Quantitative Researcher (Part-Time)
- Determined the benchmark prices of Cryptos by weighted averaging the high-quality prices, resulting in 99% of accuracy on over 80% of Cryptos traded on the market
- Ranked and denoised the different Crypto prices from different exchanges into high- and low-quality by applying Python K-means clustering
- Weighted the high-quality prices by recording the performance of each exchange within the window obtained by Hyper-parameters Tunning
- Enhanced the weights of high-quality prices by applying Fourier Transform for signal enhancement
- Excluded the anomalies of prices by detecting Stale Quote, Missing Quote and Negative Bid/Ask Spread

CTBC Securities Limited **Taipei, Taiwan**
Quantitative Researcher (Intern) Jun. 2021 – Aug. 2021
- Designed Alpha Strategy by constructing long-only ETFs portfolio with applying Python Lasso Regression on components selection and Mathematical Programming to restrict the number of components, stop loss and minimum trading volume, resulting in 3.8 of Sharpe Ratio on 10 years daily closing data
- Monitored cumulative return on 23 ETFs and conducted attribution analysis by Python by identifying sources of excess return; derived insights for weekly reports and presented findings to VP
- Assisted Chief Quantitative Researcher for developing and back-testing multi-factor model by applying Mathematical Programming and Statistical Methods, identified 5 positive factors that are significant in 10 years daily closing data

Ardentec Corporation **Hsinchu, Taiwan**
Data Scientist (Intern) Jun. 2020 – Aug. 2020
- Automized the abnormal signals detection of wafer testing process by conducting Hypothesis Test and developing Python-based Software, reducing the process time from 30 minutes to 2 minutes
- Developed the data-driven algorithm by applying Queuing Theory, reducing the waiting of procedures by 26%

RESEARCH EXPERIENCE

Bincentive Trading Strategy Competition **Taipei, Taiwan**
- Designed Statistical Arbitrage Strategy on Bitcoin and Fitted Portfolio with applying Cointegration, resulting in 33% of return

OTHERS

Languages: Mandarin Chinese: native, Japanese: native