SIHAN LIU

201-204-7347 // sihan.liu@nyu.edu // linkedin.com/in/sihanliu643

EDUCATION

Expected 12/23 **NEW YORK UNIVERSITY** New York, NY
The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- ***Coursework:*** portfolio theory, factor model, market impact (Almgren-Chriss), Black-Scholes, equity derivatives, cryptocurrency

09/18 - 06/22 **NEW YORK UNIVERSITY SHANGHAI** Shanghai, China
B.S., Double Major in Honors Mathematics (Pure Math) and Data Science
- ***Coursework:*** machine learning, data structures, relational database
- ***Honors/Awards:*** Dean's list for 4 years, Latin Honors Cum Laude (GPA top 30%)

EXPERIENCE

12/21 - 01/22 **GUOTAI JUNAN SECURITIES CO., LTD.** Shanghai, China (remote)
Quantitative Research Intern (Python)
- Presented monthly stock market overview, including evaluation of key indicators (e.g., index returns, cross-sectional volatility, sector returns), to manager
- Backtested double-moving-average strategy on 500 ETF; procedure: data preprocessing, signal detection, performance analysis, holding period analysis, and visualization tools
- Achieved 7.87% annualized return, 0.66 Sharpe ratio, and 23% max drawdown; process of attempting to improve strategy promoted deeper thinking about data scarcity

06/21 - 08/21 **ATOS INFORMATION TECHNOLOGY** Chengdu, China
Data Analyst Intern (Excel, VBA, Power Query)
- Generated daily reports to display operational data clearly and concisely
- Automated process of generating reports and sending emails using VBA and Power Query; result: reductions to 25% of production time and 17% of disk memory used by data

08/20 - 09/20 **SICHUAN WANYI ENERGY TECHNOLOGY CO., LTD.** Chengdu, China
R&D / Data Mining Intern (Python)
- Monitored dataset quality used in supervised ML model for image recognition
- Generated synthetic image dataset to augment real-world datasets; corrected thousands of labels misrecognized by ML model

PROJECTS

03/23 - 04/23 **Algorithmic Trading Framework (Covariance Estimation, Portfolio Optimization, Python)**
- Conformed 3-month S&P 500 stocks' binary quotes and trades second-level tick data
- Bucketed second-level trades data with optimal minute span that generated non-autocorrelated return series (calculated with first and last trade prices) without bid-ask bounce effect
- Estimated covariance matrix for use in mean variance portfolio optimization with 3 approaches: empirical covariance, "clipped," and "optimalShrinkage" estimators
- Evaluated performance of covariance estimators based on paper by Bun Bouchaud

01/23 - 02/23 **Nonlinear Pairs Trading Strategy (Backtesting, Python)**
- Researched and backtested nonlinear pairs trading strategies (cointegration, machine learning, copula, stochastic control based strategies), further enhanced with half-life and VIX data
- Built large backtest system that prevented look-ahead bias and used online parameter updates

05/21 - 06/21 **Music Classification Based on Emotions (Machine Learning, Python)**
- Designed SVM, decision trees, and random forest models to classify musical audios into 3 categories: sad, calm, energetic; result: achieved 88% accuracy

COMPUTATIONAL SKILLS

Programming Languages: Python, Java, JavaScript, SQL, VBA, Power Query M
Other: Python Flask, HTML, LaTex