SOOHAN KIM

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EDUCATION

Expected 12/24 **NEW YORK UNIVERSITY** New York, NY
The Courant Institute of Mathematical Sciences
M.S. in Mathematics in Finance
- ***Expected Coursework:*** data-driven modeling, portfolio optimization, stochastic calculus, financial data science, dynamic asset pricing, time series analysis, advanced statistical inference

03/17 - 06/23 **SUNG KYUN KWAN UNIVERSITY** Suwon, South Korea
B.S. in Mathematics and Computer Science
- ***Coursework:*** ODE/PDEs, linear algebra, real/numerical analysis, measure theory, financial mathematics, topology, data structures, algorithms, machine learning, deep neural networks
- ***Honors:*** Magna Cum Laude (top 5% in graduating class)

EXPERIENCE

11/18 - 04/20 **U.S. ARMY GARRISON DAEGU** Daegu, South Korea
Sergeant, Public Affairs Specialist
- Conducted photoshoots and interviews; posted articles regarding important events within garrison community
- Facilitated timely delivery of accurate information regarding garrison policies and measures during COVID-19 pandemic
- Awarded Army Achievement Medal for excellent performance for interpreting during U.S. Army Garrison Daegu and local South Korean army regiment leadership conference

PROJECTS

09/22 - 05/23 **SUNG KYUN KWAN UNIVERSITY** Suwon, South Korea
Portfolio Optimization With Reinforcement Learning (Python)
- Built and trained AI agent that allocates weights for U.S. equities portfolio, resulting in 23.9% annual returns and 0.86 Sharpe ratio
- Used fractional differentiation to preprocess stock price data efficiently; conducted Dickey-Fuller tests, checking stationarity with minimal signal loss
- Programmed graph neural networks to learn inter-stock relationships when building state-space
- Applied adversarial inverse reinforcement learning using modern portfolio theory; calculated expert weights from past data that agent imitates and extrapolates to future data

02/22 - 10/22 **SK COMPUTER AND COMMUNICATIONS and KB SECURITIES** Seoul, South Korea
Optimal Trade Execution With Reinforcement Learning (Python)
- Developed AI agent that generated daily buy order prices, 88%+ of which were within 10 bps, vs. daily VWAP
- Used proximal policy optimization algorithm to train AI agent on high market-cap Korean stocks; worked with tick-level stock data
- Incorporated transformer networks that predicted U-shaped patterns of intraday volumes, enhancing performance from 64%+ to 88%+
- Wrote research paper, currently under review by *Expert Systems with Applications*

07/21 - 07/22 **SUNG KYUN KWAN UNIVERSITY** Suwon, South Korea
Volatility Surface Prediction With Physics-informed Deep Learning (Python)
- Proposed and implemented physics-informed convolutional transformer network for predicting volatility surface of SPX European call options
- Wrote research paper, under review by *Quantitative Finance*, reporting proposed network's mean absolute percentage error results: 4.92 (volatility prediction) and 3.85 (option price prediction)

COMPUTATIONAL SKILLS / OTHER

Programming Languages: Python (pandas, numpy, pytorch, tensorflow), C/C++, Java, Mathematica, Unix shell
Languages: English (fluent), Korean (native)
Award: Army Achievement Medal (U.S. Army)