



Geonwoo Shin

FINANCIAL AI | ASSET ALLOCATION | TIME-SERIES MODELING

M.S. Candidate, Industrial Engineering, Seoul National University (expected Feb. 2027)

✉ shin000621@gmail.com | 📧 larcenous | 📄 Google Scholar

Profile

Master's student in Industrial Engineering at Seoul National University ([SLCF Lab](#)), interested in applying machine learning and LLMs to financial decision-making, particularly asset allocation. First-authored research on LLM-driven Black-Litterman portfolio allocation (APIEMS 2025 oral), with experience implementing retrieval-augmented ETF analysis and financial engineering models; Certified Investment Manager. Research contributions in time-series modeling include two NeurIPS 2026 papers on imputation and watermarking (one as co-first author) and explainable anomaly detection published in Pattern Recognition.

Education

Seoul National University

GPA 3.78 / 4.3

M.S. IN INDUSTRIAL ENGINEERING, STATISTICAL LEARNING AND COMPUTATIONAL FINANCE LAB

Mar. 2025 - Feb. 2027 (expected)

- Finance-related coursework: Derivatives, Fixed Income Investment, Convex Optimization, Reinforcement Learning, Engineering Economic Analysis.

Korea University

GPA 3.79 / 4.5

B.S. IN INDUSTRIAL MANAGEMENT ENGINEERING

Mar. 2019 - Feb. 2025

- Finance and data coursework: Financial Economics, Principles of Economics, Multivariate Analysis; 141 credits completed.

Research Experience

LLM Self-Reflection for Black-Litterman Asset Allocation

Seoul National University

FIRST AUTHOR; APIEMS 2025 ORAL, KIIE POSTER

Mar. - Aug. 2025

- Designed a reflection loop in which an LLM generates per-stock views from price history and sector news, critiques them, and feeds them into the Black-Litterman prior ([code](#)).
- Built a Chroma vector-DB memory of past decisions and ran ablations separating recent and similar-regime memory on a 55-stock universe (top 5 by market cap per sector); limited the backtest (Sep. 2024 - Mar. 2025) to after the LLM's knowledge cutoff to prevent look-ahead leakage.
- Similar-regime memory alone gave the best results (Sharpe 0.76, CAGR 25.59%); removing reflection produced the largest draw-down (23.54%). Combining both memories cut the Sharpe ratio to 0.19, showing that more context does not always improve decisions.

What Vector Quantization Discards in Conditional Factor Models

Seoul National University

SOLE AUTHOR; IN PROGRESS

Jan. 2026 - Present

- Analyzing whether quantizing U.S. equity characteristics (153 JKP characteristics, 1957 - 2024) with a single codebook discards low-variance but price-relevant structure; designed a partitioned codebook with an independent codebook per subspace.

Publications

- A Locally Tokenized Generative Model for Robust Time-Series Watermarking.** Dongbin Kim, **Geonwoo Shin** (co-first author), Yujin Choi, Soyeon Park, Jaewook Lee. *NeurIPS 2026*, Poster. [arXiv:2608.19727](#). Role: VQ-VAE literature review and baseline experiments.
- Discretizing Continuous Time Series for Imputation with Masked Diffusion Training.** Dongbin Kim, Seungyun Lee, **Geonwoo Shin**, Jaewook Lee. *NeurIPS 2026*, Poster. [arXiv:2608.19119](#). Role: literature review shaping the research direction.
- JoCE: Joint Counterfactual Explanations for Interpretable Time Series Anomaly Detection.** Woojin Jeong, **Geonwoo Shin**, Jaewook Lee. *Pattern Recognition* 177 (2026). [doi:10.1016/j.patcog.2026.113324](#). Role: validation and investigation.
- Market-Adaptive Memory LLM for the Black-Litterman Model.** **Geonwoo Shin** et al. *APIEMS 2025*, Oral. First author.

Projects

LLM-based U.S. ETF Curation

NH Investment & Securities

BIG DATA COMPETITION TEAM PROJECT; ENCOURAGEMENT AWARD

Aug. - Dec. 2024

- Built a RAG pipeline (LangGraph, Azure GPT-4o-mini, Chroma DB) that generates investor-profile-specific ETF reports grounded in holdings-level news and industry trends (own responsibility).
- Checked how the competition-provided return data was calculated, then collected adjusted closes from Yahoo Finance and re-computed returns for all ETFs on one consistent basis.
- Beyond my assigned scope, built a 5-factor ETF scoring engine (return, volatility/MDD, dividend, liquidity, investor sentiment) and a return calculator covering FX, fees, and capital-gains tax, so the LLM's recommendations could be cross-checked against quantitative metrics.

WorldQuant IQC 2024 Alpha Development

WorldQuant

TEAM TIGERQUANT; GLOBAL TOP 20%, 1ST AT UNIVERSITY

Mar. - Jun. 2024

- Derived hypotheses from factor literature, designed multiple market-neutral alphas on U.S. and Chinese equity data, and validated them by backtest; advanced to Stage 2.

Machine Learning on Financial Data (Multivariate Analysis)

Korea University

COURSE PROJECT

Mar. - Jun. 2024

- Applied multivariate statistics and ML/DL methods to Home Credit default-risk prediction, bank customer churn, auto-insurance fraud detection, and clustering of 400 NYSE stocks by financial indicators ([code](#)).

2nd KRX Stock Investment Algorithm Competition

Korea Exchange

PARTICIPANT

Jul. 2023

- Built a long-short equity portfolio from capital-market and public data, using LSTM-based time-series forecasts to rank stocks.

MMRAG 2025 Challenge

Seoul National University

COURSE PROJECT; 37TH OF 256 TEAMS

Mar. - Jun. 2025

- Fine-tuned Llama-3.2-11B-Vision-Instruct for a multimodal retrieval-augmented generation benchmark.

Korean Institute of Industrial Engineers Undergraduate Contest

KIIE

PARTICIPANT

Jun. - Oct. 2023

- Modeled hospital patient allocation during a pandemic as a Markov decision process and implemented a dynamic programming algorithm to compute the allocation policy.

HVAC Time-Series Prediction, Capstone Design I & II

Korea University

TEAM LEADER (CAPSTONE I); EXCELLENCE AWARD

Sep. 2023 - Jun. 2024

- Built ensemble models for indoor temperature prediction from retail-store HVAC control data and interpreted them with SHAP; extended to CNN/RNN power-consumption forecasting in Capstone II.

Automatic IPC Classification of Patent Documents

Korea University

TEAM LEADER; BEST PAPER AWARD

Sep. - Dec. 2023

- Built a KoBERT text-classification pipeline that assigns IPC codes to patent documents; received the Best Paper Award at the 2023 Fall Conference of the Korea Invention Promotion Association.

LG Aimers 3rd Hackathon

LG AI Research

PARTICIPANT; FINALIST

Jul. - Aug. 2023

- Developed RNN-based sales forecasting models for online products; advanced to the final round.

Extracurricular Activities

UFEA - University Financial Engineering Association

Seoul, Korea

DEPUTY TEAM LEADER (1ST HALF); VICE PRESIDENT (2ND HALF)

Jan. - Dec. 2024

- Options and volatility: studied option pricing, the Black-Scholes model, volatility smile models, and hedging through discussion-based seminars on Wilmott's *Paul Wilmott on Quantitative Finance* and Derman's *The Volatility Smile*; computed SPX implied volatility from CBOE data and simulated delta-hedged portfolio P&L.
- Fixed income: studied the term structure of interest rates and bond pricing models with Veronesi, Hull, and Neftci.
- Macro session: ran a separate weekly session summarizing domestic and global economic news and securities analyst reports, interpreting current market conditions through the theory covered in seminars.
- C/C++ study group: progressed from C fundamentals (pointers, structs, memory allocation) to Armstrong's *C++ for Financial Mathematics* and Joshi's *C++ Design Patterns and Derivatives Pricing*; implemented option-pricing routines and multithreaded Monte Carlo simulation in C++.
- Coordinated seminar schedules and prepared sessions in both semesters (github.com/larcenous/UFEA).

Republic of Korea Army, 52nd Infantry Division

Seoul, Korea

SERGEANT (HONORABLY DISCHARGED)

Jul. 2020 - Jan. 2022

- Served as an information specialist managing plain and classified document communications.

Teaching Experience

SNU-KBI Data Science Program

CAPSTONE TEACHING ASSISTANT

May - Jul. 2026

- Mentored bank and securities professionals on credit-rating prediction and property-recommendation agent projects from scoping onward; a mentored team received an Excellence Award.

SNU KDT Big Data, Fintech and AI Program

TEACHING ASSISTANT, MACHINE LEARNING AND DEEP LEARNING

2025 - 2026

- Supported cohorts 11 - 13 through practical-code feedback and technical Q&A.

Samsung DS² Program, 13th Cohort

TEACHING ASSISTANT, LINEAR ALGEBRA AND OPTIMIZATION

2025

- Supported course delivery, assignment grading, and student questions.

Awards

2024	Encouragement Award , Big Data Competition (ETF Curation)	NH Investment & Securities
2024	Global Top 20%, 1st at University , IQC 2024 Stage 1	WorldQuant
2023	Excellence Award , Capstone Design	Korea University LINC
2023	Best Paper Award , Fall Conference (Automatic IPC Classification of Patents)	KIPA
2023	Finalist , LG Aimers 3rd Hackathon	LG AI Research

Certifications & Skills

Certifications: Certified Investment Manager (Korea Financial Investment Association, Jun. 2024); SQLD (Oct. 2023); ADsP (Mar. 2023).

Programming: Python (PyTorch, pandas, scikit-learn, Matplotlib), C/C++, SQL, R.

Modeling: Asset allocation (Black-Litterman, mean-variance, CVaR), factor models, backtesting, time-series deep learning (VQ-VAE, diffusion).

Financial Engineering: Black-Scholes model, volatility smile, delta hedging, term structure and bond pricing, Monte Carlo simulation.

LLM: LangGraph, RAG (Chroma), Azure OpenAI, VLM fine-tuning.

Languages: Korean (native); English (OPIc IM2, Aug. 2026).