

Namhyoung Kim

Quantitative AI Researcher · Ph.D. in Industrial Engineering

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Quantitative AI Researcher at **Risk X tech Lab** with a Ph.D. in Industrial Engineering from Hanyang University, advised by Prof. Jae Wook Song at the FINX Lab. I build **representation-learning models for financial markets** — vector-quantized latent factors, physics-informed operators, language-aligned codebooks — and ship them to industry: pension portfolios, structured-product pricing, exotic-options hedging, and asset-risk grading. Published at **Knowledge-Based Systems** (IF 7.6, JCR Q1) and **ACM ICAIF '25** (oral, acceptance 15.5%). 7 funded industry collaborations across KFTC, FnDataLab, and others.

SELECTED PUBLICATIONS

ICAIF '25

Deep Mean-Reversion: A Physics-Informed Contrastive Approach to Pairs Trading

Namhyoung Kim, Yosep Na, Jae Wook Song

Proc. 6th ACM Int'l Conf. on AI in Finance, 2025. Oral · Acceptance 15.5%

KBS '25

FactorVQVAE: Discrete Latent Factor Model via Vector Quantized Variational Autoencoder

Namhyoung Kim, Seung Eun Ock, Jae Wook Song

Knowledge-Based Systems, 2025: 113460. IF 7.6 · JCR Q1 (Top 6%, AI / CS)

Working

Vector-Quantized Discrete Latent Factors Meet Financial Priors: Cross-Sectional Stock Ranking

Namhyoung Kim, Jae Wook Song

Under review. Hybrid VQ + financial-prior factor model for portfolio construction.

Working

LEXICON: Making Factors Talk with Language-Aligned Discrete Codebooks in Stock Return Prediction

Namhyoung Kim, Yosep Na, Jiwon Park, Jae Wook Song

Under review. Aligns latent factor codebooks with natural-language descriptors.

SELECTED INDUSTRY PROJECTS

2025

Analysis of Financial Activities using AI Technologies

Korea Financial Telecommunications & Clearings Institute (KFTC) · 2025.03 – 2025.07

Designed AI pipelines to analyze nationwide financial-activity data for KFTC.

2024

Machine-Learning-Based Model Portfolios for Retirement Pension Management

FnDataLab · 2024.03 – 2024.06

Built ML model portfolios deployed to retirement-pension product line.

2023

Pricing of Exotic Options & Structured Products via Machine Learning

Confidential financial institution · 2023.07 – 2024.01

Replaced Monte-Carlo pricing pipelines with neural surrogates for fast structured-product valuation.

2023

Machine-Learning-Driven Risk Rating Assessment of Global Investment Assets

FnDataLab · 2023.05 – 2023.08

Cross-asset risk-rating model using ensembles + factor-mining.

2022

Sales Analytics based on Graph Neural Networks & NLP

IOI Soft · 2022.08 – 2022.11

GNN + NLP pipeline on B2B transaction graphs to forecast revenue and surface upsell opportunities.

EDUCATION

2026

Ph.D. in Industrial Engineering — Hanyang University

Dissertation: *Representation Learning in Financial Markets for Portfolio Management*

Advisor: Prof. Jae Wook Song · GPA 4.31 / 4.50 · 2021.03 – 2026.02

2020

B.A. in Economics & Finance (Minor: Finance) — Hanyang University

Cum Laude · GPA 4.00 / 4.50 · 2016.03 – 2020.02

HONORS & AWARDS

2024

Outstanding Paper Award — Korean Management Science Review (KORMS)

2021–23

BK21 Scholarship — National Research Foundation of Korea

2020

A.I. Graduate School Support Project Scholarship — IITP of Korea

2020

Cum Laude — Hanyang University

2018

Financial Quant Professional Training Project Scholarship — Hanyang University

SELECTED TALKS (2024–25)

ICAIF-W '25

Probabilistic Forecasting of High-Frequency Crypto Volatility (Singapore, 2025.11)

CIKM-W '25

FPQ-VAE: Dynamic Factor Model with VQ Factors for Stock Ranking (Seoul, 2025.11)

INFORMS '24

Deep Hedging of Equity-Linked Securities (Seattle, 2024.10)

IJCAI-W '24

Risk-Propensity-Specific Portfolio Recommendation via Self-Supervised Learning (Jeju, 2024.07)

TECHNICAL SKILLS

Languages

Python, SQL, LaTeX

ML / DL

PyTorch, scikit-learn, XGBoost, Hugging Face, JAX (familiar)

Finance

Factor models, portfolio optimization, derivative pricing, time-series, risk modeling

MLOps

Git, Docker, Linux, W&B, Slurm/HPC, AWS basics

Methods

VQ-VAE, contrastive learning, neural operators, GNNs, NLP / LLMs in finance

WHAT I BRING TO A DATA SCIENCE RESEARCHER ROLE

I sit at the intersection of **research rigor** (top-tier publications + Ph.D.) and **shipped impact** (7 funded industry collaborations covering pension, derivatives, risk grading, and graph analytics). I'm comfortable owning a problem end-to-end — from literature review and prototype to production model, evaluation, and stakeholder communication. My core thesis is that **discrete, interpretable representations** bridge the gap between deep models and the inductive biases finance demands; I would love to bring that to Toss.