

Lizhan HONG

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SUMMARY

Applied mathematics engineer at **École Polytechnique** doing quantitative research on stochastic models, financial time series and systematic trading signals. 3 peer-reviewed publications; **IMC Prosperity global top 1.5%**.

EDUCATION

École Polytechnique, Paris: Engineer (M.Sc. equivalent) in Applied Mathematics, Dual Degree Feb 2025 - Mar 2027
Shanghai Jiao Tong University: M.S. in Computer Science, Dual Degree Aug 2026 - Jun 2028
Shanghai Jiao Tong University: Bachelor in Computer Science, Dual Degree (GPA 4.19/4.3) Aug 2022 - Aug 2026
Coursework: Probability, Statistics, Markov Chains & Martingales, Rare-Event Simulation, Machine Learning, Data Structures & Algorithms.

AWARDS

- QRT Data Challenge, Asset Allocation Performance Forecasting: **ranked 1st** on the public leaderboard. QRT.
- IMC Prosperity Trading Competition: global rank 280 / 18,803 teams (**top 1.5%**), top 8 in France. IMC, 2026.
- National Second Prize (**top 0.17%**), CSIAM Mathematical Modeling Contest. CSIAM, 2023.
- Silver Award, Sheng Xuanhuai Innovation & Entrepreneurship Contest. SJTU, 2023.
- Champion, Shanghai Intercollegiate Bodybuilding Cup. CBBA, 2023.

RESEARCH EXPERIENCE

École Polytechnique, MathsFI Lab Paris, France
Research Assistant, Generative Modelling of Financial Time Series (Advisor: Prof. Huyen Pham) Sep 2025 - Present

- Modelled the full distribution of SPY returns with a Schrödinger bridge under stochastic volatility and jump-diffusion, for tail-risk and stress-scenario generation.
- Derived the drift and jump-intensity adjustments under the change of measure; traced a downward bias in simulated jump risk to the sequential discretization and fixed it.
- Benchmarked 7 generative models on 20 years of daily SPY (5,068 windows): **lowest Wasserstein distance**, and matched jump frequency and 95th-percentile jump size where baselines were off by **3x to 13x**.

EXPERIENCE

Shanghai Advanced Institute of Finance (SAIF), SJTU Shanghai, China
Quantitative Research Intern, Cross-Sectional Equity Alpha Jun 2024 - Aug 2024

- Tested nonlinear temporal features against a simpler baseline on CSI 300 cross-sectional returns, with rolling point-in-time out-of-sample (OOS) validation; mean rank information coefficient (IC) rose from **~0.031 to ~0.038**.
- After turnover constraints, Ledoit-Wolf covariance shrinkage and trading costs, net information ratio (IR) rose only from **~0.78 to ~0.91**: part of the signal was redundant or too costly to trade.

Orange (Wholesale / Innovation) Paris, France
Forward Deployed Engineer Intern, Probabilistic Forecasting Jun 2026 - Present

- Network-traffic forecasting with the Cloud teams, tied to incident-resolution cost and SLA reliability: MASE **1.68 to 0.48**, CRPS **4.43 to 1.28** against a seasonal baseline.
- Surrogate model and rule-based root-cause system on a network digital twin: delay-prediction error **13.8% to 1.6%**, fault hypotheses checked by counterfactual replay.

AISEA Lab, Shanghai Jiao Tong University Shanghai, China
Undergraduate Research Assistant, Surrogate Modelling for High-Dimensional Inverse Problems Sep 2022 - Aug 2024

- Inverse problem on a reduced latent state (SVD-autoencoder) with a kNN surrogate and Latin Hypercube Sampling: **~1%** forward-model error, under 0.1 s per inference.
- Gradients were unreliable on the flat, non-smooth calibration objective; compared differential evolution, particle swarm and simulated annealing, then built a coarse-to-fine search reaching **~0.3%** L2 error.

PROJECTS AND LEADERSHIP

Queue-reactive limit order book simulator (Python, market microstructure): implemented the Huang, Lehalle and Rosenbaum model with queue-size-dependent limit, cancel and market order intensities; simulated queue depletion and mid-price moves.

Head of Quant, X-Finance, the student finance association of École Polytechnique.

PUBLICATIONS

3 peer-reviewed papers on hybrid machine learning for reactor digital twins, including Nuclear Science and Techniques (2024, first author) and Nuclear Engineering and Technology (2025).

SKILLS

Programming: Python (NumPy, Pandas, PyTorch, scikit-learn), SQL, Java, MATLAB, Git, Linux

Quantitative research: alpha research, factor models, backtesting, out-of-sample validation, time-series forecasting, market microstructure, portfolio optimization, covariance estimation

Mathematics and ML: probability, statistics, regression, stochastic processes, stochastic calculus, Monte Carlo, optimal transport, numerical optimization, data analysis, generative models, deep learning, LLM agents

Languages: Mandarin (native), English (fluent), French (fluent). **Interests:** rugby, American football, Hyrox, bodybuilding, CrossFit