Yilie Huang

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RESEARCH INTERESTS

- Reinforcement Learning and Machine Learning
- Mathematical Finance, Financial Engineering and FinTech
- Diffusion Models for Generative AI
- Stochastic Control and Applied Probability

EDUCATION

Columbia University Sept 2019 - Dec 2024
Fu Foundation School of Engineering and Applied Science USA
Doctor of Philosophy in Industrial Engineering and Operations Research
Advisor: Xunyu Zhou
Dissertation: *Reinforcement Learning for Continuous-Time Linear-Quadratic Control and Mean-Variance Portfolio Selection: Regret Analysis and Empirical Study*

Columbia University Sept 2017 - Dec 2018
Fu Foundation School of Engineering and Applied Science USA
Master of Science in Operations Research
Advisor: Xunyu Zhou

Zhejiang University Sept 2013-Jul 2017
Chu KoChen Honors College China
Bachelor of Science in Mathematics and Applied Mathematics (Honors Program)

The University of Hong Kong Sept 2015-May 2016
Faculty of Science Hong Kong
Exchange student

CFA Institute Since Feb 2022
CFA® (Chartered Financial Analyst) charterholder

ACADEMIC POSITIONS

Columbia University Jan 2025 - Present
Fu Foundation School of Engineering and Applied Science USA
Postdoctoral Research Scientist in Industrial Engineering and Operations Research

- Formulates model distillation in diffusion models as an optimal control problem, using RL to learn provably efficient adaptive timestep policies that accelerate sampling and enhance fidelity without modifying the backbone.
- Develops randomized exploration methods for high-dimensional stochastic control, offering model-free alternatives when analytical solutions are unavailable and classical dynamic programming becomes computationally prohibitive.

RESEARCH PAPERS

Publications

Huang, Y., Jia, Y., & Zhou, X. (2025). Sublinear Regret for a Class of Continuous-Time Linear–Quadratic Reinforcement Learning Problems. SIAM Journal on Control and Optimization, 63(5), 3452-3474.

Huang, Y. (2025). Continuous-Time Reinforcement Learning for Asset–Liability Management. In Proceedings of the 6th ACM International Conference on AI in Finance, 360-368.

Huang, Y., Jia, Y., & Zhou, X. (2022). Achieving Mean–Variance Efficiency by Continuous-Time Reinforcement Learning. In Proceedings of the 3rd ACM International Conference on AI in Finance, 377-385.

Preprints

Huang, Y., Tang, W., & Zhou, X. (2026). ART for Diffusion Sampling: A Reinforcement Learning Approach to Timestep Schedule. Under review.

Huang, Y. & Zhou, X. (2025). Data-Driven Exploration for a Class of Continuous-Time Indefinite Linear–Quadratic Reinforcement Learning Problems. Under revision, IEEE Transactions on Automatic Control.

Huang, Y., Jia, Y., & Zhou, X. (2024). Mean–Variance Portfolio Selection by Continuous-Time Reinforcement Learning: Algorithms, Regret Analysis, and Empirical Study. Under revision, Management Science.

PRESENTATIONS

Invited Talks

Workshop on Stochastic Control, Financial Technology, and Machine Learning (Hong Kong)	Dec 2025
The 6th ACM International Conference on AI in Finance (Singapore)	Nov 2025
Control and Optimization Seminar (UConn)	Nov 2025
INFORMS Annual Meeting (Atlanta)	Oct 2025
Mathematical Finance and Stochastic Analysis Seminar (HU/TU Berlin)	Oct 2025
Berkeley–Columbia Meeting in Engineering and Statistics (UC Berkeley)	Oct 2025
SIAM Conference on Financial Mathematics and Engineering (Miami)	Jul 2025
World Online Seminar on Machine Learning in Finance (Online)	Feb 2025
Columbia IEOR Colloquium (Columbia U)	Nov 2024
INFORMS Annual Meeting (Seattle)	Oct 2024
INFORMS Conference on Financial Engineering and FinTech (Hong Kong)	Aug 2024
INFORMS Annual Meeting (Indianapolis)	Oct 2022
11th World Congress of Bachelier Finance Society (Online)	Jun 2022

Posters

NYC Operations Day (New York)	Mar 2025
Columbia AI Summit (Columbia U)	Mar 2025
DSI Financial and Business Analytics Poster Session (Columbia U)	Feb 2025

DSI Financial and Business Analytics Poster Session (Columbia U) Nov 2022

INDUSTRY EXPERIENCE

Tower Research Capital, Mako/Ace Trading Team Feb 2023 – May 2023
Quant Trader Intern New York, NY, USA

- Engineered 20,000+ high-frequency factors for futures and developed a trading strategy achieving a Sharpe ratio above 5.
- Designed a stepwise–stagewise factor-selection algorithm that consistently outperformed the firm's production model and was integrated into the core pipeline.

Millennium Management, Equity Derivatives Quant Team Jun 2022 – Aug 2022
Quant Researcher Intern New York, NY, USA

- Built 2-D PDE solvers for Asian option pricing using Alternating Direction Implicit and Strang Splitting, outperforming Monte Carlo in accuracy and speed.
- Implemented production-grade C++ modules supporting continuous/discrete averaging, American exercise, local volatility, and Buehler's dividend model.

LevelHead Capital, Quantitative Value Investing Jan 2018 – Jul 2018
Quant Trader Intern New York, NY, USA

- Applied deep learning methods such as CNN, LSTM, and GRU models to predict stock movements with over 60% accuracy.
- Enhanced value-investing algorithms by introducing new fundamental factors and selecting optimal combinations via machine learning models.

TEACHING EXPERIENCE

Columbia University

Teaching Assistant	New York, NY, USA
IEOR E4602, Quantitative Risk Management	Fall 2023
IEOR 4630, Asset Allocation	Spring 2023
IEOR E4732, Computational Methods in Finance	Spring 2022
IEOR E4701-001, Stochastic Models for Financial Engineering	Fall 2021
IEOR E4701-002, Stochastic Models for Financial Engineering	Fall 2021
IEOR 4524, Analytics in Practice: MSBA Capstone	Spring 2021
IEOR 4100, Probability, Statistics and Simulation	Fall 2020
IEOR 4101, Probability, Statistics and Simulation	Fall 2020
IEOR 4707, Financial Engineering: Continuous-Time Models	Spring 2020
IEOR 4735, Structured & Hybrid Products	Fall 2018

PROFESSIONAL SERVICE

Referee

Journal of the Operational Research Society
Quantitative Finance
Mathematics and Financial Economics
Digital Finance
IMA Journal of Management Mathematics
ACM International Conference on AI in Finance
NeurIPS Workshop on Generative AI in Finance

Session Chair

The 6th ACM International Conference on AI in Finance (Singapore)	Nov 2025
2024 INFORMS Annual Meeting (Seattle)	Oct 2024