

# Yilie Huang

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500 W. 120th St., Room 321, New York, NY 10027  
(+1) 646-775-1656  
yh2971@columbia.edu  
<https://yiliehuang.github.io>

## RESEARCH INTERESTS

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

## EDUCATION

<b>Columbia University</b> Fu Foundation School of Engineering and Applied Science <i>Doctor of Philosophy in Industrial Engineering and Operations Research</i> Advisor: Xunyu Zhou Dissertation: <i>Reinforcement Learning for Continuous-Time Linear-Quadratic Control and Mean-Variance Portfolio Selection: Regret Analysis and Empirical Study</i>	Sept 2019 - Dec 2024 USA
<b>Columbia University</b> Fu Foundation School of Engineering and Applied Science <i>Master of Science in Operations Research</i> Advisor: Xunyu Zhou	Sept 2017 - Dec 2018 USA
<b>Zhejiang University</b> Chu KoChen Honors College <i>Bachelor of Science in Mathematics and Applied Mathematics (Honors Program)</i>	Sept 2013-Jul 2017 China
<b>The University of Hong Kong</b> Faculty of Science <i>Exchange student</i>	Sept 2015-May 2016 Hong Kong
<b>CFA Institute</b> CFA® (Chartered Financial Analyst) charterholder	Since Feb 2022

## ACADEMIC POSITIONS

<b>Columbia University</b> Fu Foundation School of Engineering and Applied Science <i>Postdoctoral Research Scientist in Industrial Engineering and Operations Research</i>	Jan 2025 - Present USA
<ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li></ul>	

## 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. & 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 Review.

### In Progress

Huang, Y., Tang, W., & Zhou, X. (n.d.). Adaptive Reparameterized Time for Diffusion Sampling: A Reinforcement Learning Approach to Timestep Allocation. In progress.

## 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

	<b>Posters</b>		
	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
<b>INDUSTRY EXPERIENCE</b>			
	<b>Tower Research Capital</b> , Mako/Ace Trading Team	Feb 2023 – May 2023	
	Quant Trader Intern	New York, NY, USA	
	<ul style="list-style-type: none"> <li>• Engineered 20,000+ high-frequency factors for futures and developed a trading strategy achieving a Sharpe ratio above 5.</li> <li>• Designed a stepwise–stagewise factor-selection algorithm that consistently outperformed the firm's production model and was integrated into the core pipeline.</li> </ul>		
	<b>Millennium Management</b> , Equity Derivatives Quant Team	Jun 2022 – Aug 2022	
	Quant Researcher Intern	New York, NY, USA	
	<ul style="list-style-type: none"> <li>• Built 2-D PDE solvers for Asian option pricing using Alternating Direction Implicit and Strang Splitting, outperforming Monte Carlo in accuracy and speed.</li> <li>• Implemented production-grade C++ modules supporting continuous/discrete averaging, American exercise, local volatility, and Buehler's dividend model.</li> </ul>		
	<b>LevelHead Capital</b> , Quantitative Value Investing	Jan 2018 – Jul 2018	
	Quant Trader Intern	New York, NY, USA	
	<ul style="list-style-type: none"> <li>• Applied deep learning methods such as CNN, LSTM, and GRU models to predict stock movements with over 60% accuracy.</li> <li>• Enhanced value-investing algorithms by introducing new fundamental factors and selecting optimal combinations via machine learning models.</li> </ul>		
<b>TEACHING EXPERIENCE</b>			
	<b>Columbia University</b>		
	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	
<b>PROFESSIONAL SERVICE</b>			
	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)  
2024 INFORMS Annual Meeting (Seattle)  
11th World Congress of Bachelier Finance Society (Online)

Nov 2025  
Oct 2024  
June 2022