Xinyu Li

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POSITION

University of Oxford *Sep 2025 – Present*
Postdoctoral Research Associate, Mathematical Institute
Erlangen AI Hub

EDUCATION

University of California, Berkeley *09/2020 - 08/2025*
Industrial Engineering and Operations Research (Ph.D.)
Thesis Title: An α-potential game framework for non-cooperative dynamic games: theory and algorithms
Advisor: Xin Guo

New York University Shanghai *09/2016-05/2020*
Mathematics with *honors* (B.S.)

RESEARCH INTERESTS

Reinforcement Learning and Machine Learning Theory, Networked and Multi-Agent Systems, Stochastic Control, Game Theory, Applied Probability, Mean-Field and McKean–Vlasov Systems, Rough Path Theory
Mathematical Finance and FinTech, Supply Chain, Transportation System

INDUSTRY EXPERIENCE

Amazon, Santa Clara, CA *05/2023-08/2023*
Middle Mile Planning, Research & Optimization Sciences
Mentor: Xin Guo, Philip Kaminsky
Efficient freight contract pricing using deep neural networks and transfer learning

Amazon, Santa Clara, CA *05/2022-12/2022*
Middle Mile Planning, Research & Optimization Sciences
Mentor: Xin Guo, Philip Kaminsky
Freight market rates forecast using machine learning models and signature transform

PUBLICATIONS

- X. Guo, X. Li, R. Xu, "Fast policy learning for linear quadratic control with entropy regularization", *SIAM Journal on Control and Optimization*, 2025.
- X. Guo, X. Li, Y. Zhang, "An α-potential game framework for N-player dynamic games", *SIAM Journal on Control and Optimization*, 2025.
- X. Guo, X. Li, C. Maheshwari, S. Sastry, M. Wu, "Markov α-potential games", *IEEE Transactions on Automatic Control*, 2025.

- H. Gu, X. Guo, TL. Jacobs, P. Kaminsky, X. Li, "Transportation marketplace rate forecast using signature transform", *INFORMS Journal of Applied Analytics*, 2025.

  Finalist of the 2024 *INFORMS Daniel H. Wagner Prize for Excellence in the Practice of Advanced Analytics and Operations Research.*

  A short version was accepted by *30th SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2024.

- Z. Zong, X. Li, P. Sanaei, "Effects of nutrient depletion on tissue growth in a tissue engineering scaffold pore", *Physics of Fluids*, 2021.

WORKING PAPERS

- H. Gu, X. Guo, X. Li, "Adversarial training for gradient descent: analysis through its continuous-time approximation", Revision at *Journal of Applied Probability*, 2025.
- X. Guo, X. Li, Y. Zhang, "Distributed games with jumps: An α-potential game approach", Submitted *to Mathematical Finance*, 2025
- O. Bokanowski, JF. Chassagneuxm, X. Li, C. Reisinger, "Convergence analysis of learning open-loop mean field control", *In preparation*, 2025
- X. Guo, A. Kakhbod, X. Li, Y. Zhao, "Equity premium prediction using signature transform", *In preparation*, 2025

INVITED TALKS

- PGMODAYS, EDF Lab Paris-Saclay, Palaiseau, France, 2025
- Bridging Stochastic Control and Reinforcement Learning: Theories and Applications, Newton Institute, Cambridge, UK, 2025
- 2025 INFORMS Annual Meeting, Atlanta, GA, 2025
- Oxford Mathematical and Computational Finance Seminar, Oxford University, Oxford, UK, 2025
- Machine Learning and Data Science Seminar, Oxford University, Oxford, UK, 2025
- Erlangen AI Hub Seminar, Oxford University, Oxford, UK, 2025
- Oxford-Princeton Workshop on Stochastic Analysis and Mathematical Finance, Oxford University, Oxford, UK, 2025
- SIAM Conference on Financial Mathematics and Engineering (FM25), Miami, FL, 2025
- Advances in Stochastic Control and Reinforcement Learning, Banff, Canada, 2025
- 2025 Western Conference on Mathematical Finance, USC, CA, 2025
- 2024 INFORMS Annual Meeting, Seattle, WA, 2024
- 2024 Joint Statistical Meetings, Portland, OR, 2024
- Banff Workshop on "New Trends and Challenges in Stochastic Differential Games", Canada, 2024 (Online)
- Cyber Risk and Insurance France-Berkeley Conference, UC Berkeley, CA, 2024
- 58th Annual Conference on Information Sciences and Systems, Princeton University, NJ, 2024
- 4th ACM International Conference on AI in Finance, NY, 2023 (Online)
- 2023 INFORMS Annual Meeting, Phoenix, AZ, 2023

- International Congress on Industrial and Applied Mathematics, Waseda University, Tokyo, Japan, 2023 (Online)
- Berkeley-Columbia Workshop, Columbia University, NY, 2023
- Western Conference on Mathematical Finance, UC Berkeley, CA, 2023

TEACHING EXPERIENCE

Graduate Student Instructor at UC Berkeley:

- IEOR 221 Introduction to Financial Engineering (Graduate), Spring 2025
- IEOR 221 Introduction to Financial Engineering (Graduate), Spring 2024
- IEOR 222 Financial Engineering System (Graduate), Spring 2023
- IEOR 242 Application in Data Analysis (Graduate), Spring 2022
- IEOR 142 Introduction to Machine Learning and Data Analysis, Fall 2022

Teaching Assistant at NYU Shanghai:

- Multivariable Calculus
- Introduction to Computer Programming

AWARDS AND SCHOLARSHIPS

- Finalist, INFORMS Daniel H. Wagner Prize for Excellence in the Practice of Advanced Analytics and Operations Research *2024*
- Berkeley Marshall-Oliver-Rosenberger Fellowship *2024*
- UC Berkeley IEOR Departmental Fellowship *2020*
- NYU Shanghai Excellence Award *2020*
- Zhang Xiaoqi & Cheung Kwok Ching Global Future Scholar *2018-2020*
- NYU Shanghai Dean's List of Honors *2016-2020*
- NYU Courant Summer Undergraduate Research Fund *2019*
- NYU Shanghai Deans' Undergraduate Research Fund *2018*

PROFESSIONAL SERVICE

Reviewer:

Journal of Machine Learning Research, SIAM Control and Optimization, SIAM Applied Mathematics, Journal of Applied Probability, Applied Mathematics and Optimization, Applied Mathematical Finance, IEEE Transactions on Human-Machine Systems, NeurIPS 2025 GenAI in Finance Workshop

Organizer:

Co-organizer of the workshop "Reinforcement Learning for Science: Discovery and Automation" at the Isaac Newton Institute Satellite Program (March 2026)

Service:

Member, Erlangen AI Hub *Equity, Diversity, and Inclusion (EDI)* Committee