Ruixun Zhang

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Employment

Peking University Beijing, China, 2021.7–Present
Assistant Professor and Boya Young Fellow, School of Mathematical Sciences (Financial Math)
Faculty Affiliate, Center for Statistical Science, Laboratory for Mathematical Economics and Quantitative Finance, and National Engineering Laboratory for Big Data Analysis and Applications

Columbia University New York, NY, USA
Visiting Scholar, Department of Industrial Engineering & Operations Research 2024.9–12

MIT Laboratory for Financial Engineering Cambridge, MA, USA
Research Affiliate 2015.9–2021.7

Google LLC Mountain View, CA and New York, NY, USA
Tech Lead, Senior Data Scientist 2017.8–2021.7

Vatic Labs New York, NY, USA
Partner, Market Scientist 2015.9–2017.7

Education

Massachusetts Institute of Technology Cambridge, MA, USA
Ph.D. in Applied Mathematics 2011.9–2015.9

Peking University Beijing, China
B.S. in Mathematics and Applied Mathematics; B.A. in Economics (double degree) 2007.9–2011.7

Grants

国家高层次人才计划青年项目 2021–2024
National Key R&D Program of China: "Data-driven Methods for Financial Risk Forecasting", PI 2023-2027
National Natural Science Foundation of China: "Portfolio Analytics and Risk Management for Green Investing: Theory and Application", PI 2023-2026
National Natural Science Foundation of China: "Multisource Spatio-Temporal Data for Multiscale Risk Management in Energy Systems", Co-PI 2024-2027
Yinhua Education Foundation: "Applications of Statistics and Machine Learning in Finance", PI 2023-2025
Peking University Startup Grant: "Big Data Methodologies for FinTech", PI 2021–2023
Society of Actuaries (SOA) Research Institute: "ESG for the Insurance and Pension Industry in APAC", Co-PI 2022

Honors & Awards

Commodity and Energy Markets Association (CEMA) Questrom-CEMA Best Paper Award 2024
International Centre for Pension Management (ICPM) Research Award 2023
S&P Global Academic ESG Research Award 2022
CFRI&CIRF-China Finance Review International Research Excellence Award 2023

Best Paper Prize for Young Scholars, Annual Conference of the Operations Research Society of China (Financial Engineering and Risk Management Branch), won by my PhD student	2022
Google Spot Bonus, for “Exeptional Impact” to the company (5 times)	2018–2021
Peking University NG Teng Fong/ Sino Scholarship for Outstanding Youth	2024
Peking University Lingjun Fellowship for Young Scholars	2023
Peking University Boya Young Fellow	2021
Tianjin Science and Technology Progress Award, Second Prize	2019, 2022

Publications

1. Publications with first author, alphabetical author, and corresponding author (*)

[1] *Handbook of Quantitative Sustainable Finance*
Peter Tankov* and **Ruixun Zhang*** (editor).
Chapman&Hall/CRC Financial Mathematics Series, forthcoming, 2025.

[2] *The Adaptive Markets Hypothesis: An Evolutionary Approach to Understanding Financial System Dynamics*
Andrew W. Lo* and **Ruixun Zhang***.
Oxford University Press, 2024.

[3] Debiasing Watermarks for Large Language Models via Maximal Coupling
Yangxinyu Xie, Xiang Li, Tanwi Mallick, Weijie Su, and **Ruixun Zhang***.
Journal of the American Statistical Association, forthcoming, 2025.

[4] On Consistency of Signature Using Lasso
Xin Guo, Binnan Wang, **Ruixun Zhang***, and Chaoyi Zhao*.
Operations Research, article in advance, 2025.

[5] The Checkerboard Copula and Dependence Concepts
Liyuan Lin, Ruodu Wang, **Ruixun Zhang***, and Chaoyi Zhao.
SIAM Journal on Financial Mathematics, 16(2), 2025.

[6] Convergence Rate in a Nonlinear Two-Time-Scale Stochastic Approximation with State (Time)-Dependence
Zixi Chen, Yumin Xu, and **Ruixun Zhang***.
Proceedings of the AAAI Conference on Artificial Intelligence, 39(15), 2025.

[7] Performance Attribution for Portfolio Constraints
Andrew W. Lo and **Ruixun Zhang***.
Management Science, article in advance, 2024.
- Commodity and Energy Markets Association (CEMA) Questrom-CEMA Best Paper Award.
- CFRI&CIRF-China Finance Review International Research Excellence Award.

[8] Optimal Impact Portfolios with General Dependence and Marginals
Andrew W. Lo, Lan Wu, **Ruixun Zhang***, and Chaoyi Zhao*.
Operations Research, 72(5), 2024.
- Best Paper Prize for Young Scholars, Annual Conference of the Operations Research Society of China (Financial Engineering and Risk Management).

[9] Quantifying the Impact of Impact Investing
Andrew W. Lo and **Ruixun Zhang***.
Management Science, 70(10), 2024.
- International Centre for Pension Management (ICPM) Research Award.

[10] Toward Interpretable Machine Learning: Evaluating Models for Heterogeneous Effects
Ruixun Zhang*.
Annals of Operations Research, article in advance, 2024.

[11] A Hawkes Process Analysis of High-Frequency Price Endogeneity and Market Efficiency
Jingbin Zhuo, Yufan Chen, Bang Zhou, Baiming Lang, Lan Wu, and **Ruixun Zhang***.
European Journal of Finance, 30(9), 2024.

[12] Quantifying the Returns of ESG Investing: An Empirical Analysis with Six ESG Metrics
Florian Berg, Andrew W. Lo*, Roberto Rigobon, Manish Singh, and **Ruixun Zhang***.
The Journal of Portfolio Management, 50(8), 2024.
- Reported by Institutional Investor and WealthProfessional. Blog on Duke's The FinReg Blog.

[13] Social Contagion and the Evolutionary Survival of Diverse Investment Styles
David Hirshleifer, Andrew W. Lo, and **Ruixun Zhang***.
Journal of Economic Dynamics and Control, 154, 2023.
- Blog on Harvard Law School Forum on Corporate Governance.

[14] Interpretable Image-Based Deep Learning for Price Trend Prediction in ETF Markets
Ruixun Zhang*, Guanglian Lin, and Chaoyi Zhao.
European Journal of Finance, article in advance, 2023.

[15] Explainable Machine Learning Models of Consumer Credit Risk
Randall Davis*, Andrew W. Lo*, Sudhanshu Mishra*, Arash Nourian*, Manish Singh*, Nicholas Wu*, and **Ruixun Zhang***.
The Journal of Financial Data Science, 6(3), 2023.

[16] Measuring and Optimizing the Risk and Reward of Green Portfolios
Andrew W. Lo*, **Ruixun Zhang***, and Chaoyi Zhao*.
The Journal of Impact and ESG Investing, 3(2), 2022.
- 2022 S&P Global Academic ESG Research Award.

[17] The Wisdom of Crowds vs. the Madness of Mobs: An Evolutionary Model of Bias, Polarization, and Other Challenges to Collective Intelligence
Andrew W. Lo and **Ruixun Zhang***.
Collective Intelligence, 1(1), 2022.
- Reported by AAAS, phys.org, SciTech, MIT Sloan News.

[18] The Evolutionary Origin of Bayesian Heuristics and Finite Memory
Andrew W. Lo and **Ruixun Zhang***.
iScience, 24, 2021.

[19] To Maximize or Randomize? An Experimental Study of Probability Matching in Financial Decision Making
Andrew W. Lo, Katherine P. Marlowe, and **Ruixun Zhang***.
PLoS ONE, 16(8), 2021.

[20] *Biological Economics*
Andrew W. Lo* and **Ruixun Zhang*** (editor).
Edward Elgar Publishing, 2018.

[21] Variety is the Spice of Life: Irrational Behavior as Adaptation to Stochastic Environments
Thomas J. Brennan, Andrew W. Lo, and **Ruixun Zhang***.
Quarterly Journal of Finance, 8(3), 2018.

[22] The Growth of Relative Wealth and the Kelly Criterion
Andrew W. Lo, H. Allen Orr, and **Ruixun Zhang***.
Journal of Bioeconomics, 20(1), 2018.

[23] Group Selection as Behavioral Adaptation to Systematic Risk
Ruixun Zhang, Thomas J. Brennan, and Andrew W. Lo.
PLoS ONE, 9(10), 2014.

[24] The Origin of Risk Aversion
Ruixun Zhang, Thomas J. Brennan, and Andrew W. Lo.
Proceedings of the National Academy of Sciences, 111(50), 2014.
- Reported by MIT Sloan News.

2. Other publications

[25] High-Frequency Liquidity in the Chinese Stock Market: Measurements, Patterns, and Determinants
Chaoyi Zhao, Yufan Chen, Lintong Wu, Yuehao Dai, Ermo Chen, Lan Wu, and **Ruixun Zhang**.
Pacific-Basin Finance Journal, 90, 2025.

[26] Lighting Every Darkness in Two Pairs: A Calibration-Free Pipeline for RAW Denoising
Xin Jin, Jia-Wen Xiao, Ling-Hao Han, Chunle Guo, **Ruixun Zhang**, Xialei Liu, and Chongyi Li.
International Conference on Computer Vision (ICCV), 2023.

[27] Designing An Illumination-Aware Network for Deep Image Relighting
Zuo-Liang Zhu, Zhen Li, **Ruixun Zhang**, Chun-Le Guo, and Ming-Ming Cheng.
IEEE Transactions on Image Processing, 31, 2022.

[28] IBNet: Interactive branch network for salient object detection
Xian Fang, Jinchao Zhu, **Ruixun Zhang**, Xiuli Shao, and Hongpeng Wang.
Neurocomputing, 465, 2021.

[29] A Plug and Play Fast Intersection Over Union Loss for Boundary Box Regression
Zengsheng Kuang, Xian Fang, **Ruixun Zhang**, Xiuli Shao, and Hongpeng Wang.
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2021.

[30] Learning Sparse Features with Lightweight ScatterNet for Small Sample Training
Zihao Dong, **Ruixun Zhang**, Xiuli Shao, and Zengsheng Kuang.
Knowledge Based Systems, 205, 2020.

[31] Scale-Recursive Network with Point Supervision for Crowd Scene Analysis
Zihao Dong, **Ruixun Zhang**, Xiuli Shao, and Yumeng Li.
Neurocomputing, 384, 2020.

[32] Recurrent Collaborative Filtering for Unifying General and Sequential Recommender
Disheng Dong, Xiaolin Zheng, **Ruixun Zhang**, and Yan Wang.
International Joint Conference on Artificial Intelligence (IJCAI), 2018.

Invited Talks

Keynote
Third Workshop on Energy, Climate, and ESG, the Centre for Business, Climate Change and Sustainability (B-CCaS) at the University of Edinburgh, Edinburgh, UK 2024.05

Conferences

Machine Learning in Quantitative Finance Conference 2025, Oxford, UK 2025.06

17th Annual Conference on Advances in the Analysis of Hedge Fund Strategies, Imperial College, London, UK 2025.06

9th Asian Quantitative Finance Conference, Shenzhen, China 2025.04

The Second International Conference on the Climate-Macro-Finance Interface, London, UK 2025.01

INFORMS Annual Meetings, Seattle, WA, USA 2024.10

The First INFORMS Conference on Financial Engineering and FinTech, Hong Kong, China 2024.08

Bernoulli–IMS World Congress in Probability and Statistics, Bochum, Germany 2024.08

The 3rd CSIAM Conference on Financial Mathematics, Financial Engineering, and Actuarial Science, Chengdu, China 2024.07

Commodity and Energy Markets Association Annual Meeting, Boston, MA, USA 2024.06

HK Conference for Fintech, AI and Big Data in Business, Hong Kong, China 2024.06

Annual Chicago conference on Market Microstructure, Quantitative Trading, High Frequency and Large Data, Chicago, IN, USA 2024.05

BICMR Workshop on Mathematical Finance and Insurance, Beijing, China 2024.04

15th Annual Hedge Fund Research Conference, Paris, France 2024.01

American Economic Association (AEA) Annual Meeting, San Antonio, TX, USA 2024.01

INFORMS Annual Meetings, Phoenix, AZ, USA 2023.10

10th International Congress on Industrial and Applied Mathematics (ICIAM), Tokyo, Japan 2023.08

CFRI & CIRF Joint Conference, Shanghai, China 2023.07

Asian Meeting of the Econometric Society, Beijing, China 2023.06

SIAM Conference on Financial Math and Engineering, Philadephia, PA, USA 2023.06

PKU–NUS Conference on Quant Finance and Economics, Shenzhen, China 2023.05

Energy Finance Italia 8, Milan, Italy 2023.02

China SIAM (CSIAM) Annual Meeting, Guangzhou, China 2022.11

CSIAM Financial Math Annual Conference, Suzhou, China 2022.11

INFORMS Annual Meetings, Indianapolis, IN, USA 2022.10

China International Conference in Finance (CICF), Shanghai, China 2022.07

Asian Finance (AsianFA) Annual Conference, Hong Kong, China 2022.06

Bachelier Finance Society 11th World Congress, Hong Kong, China 2022.06

American Finance Association (AFA) Annual Meetings, Boston, MA, USA 2022.01

CSIAM Activity Group of FinTech and Algorithm Conference, Zhuhai, China 2022.01

CSIAM Annual Meeting, Hefei, China 2021.10

Conference on Evolution and Financial Markets, Cambridge, MA, USA 2018.10

American Economic Association (AEA) Annual Meetings, Philadelphia, USA 2018.01

Seminars

Princeton University ORFE Financial Math Seminar, Princeton, NJ, USA 2024.12

Stanford University AFTLab Seminar Series, Palo Alto, CA, USA 2024.11

University of Waterloo Seminar in Actuarial Science and Financial Math, Ontario, Canada 2024.09

Columbia University Mathematical Finance Seminar Series, New York, NY, USA 2024.09

Princeton University ORFE S. S. Wilks Memorial Seminar in Statistics, Princeton, NJ, USA 2024.09

Imperial College London Financial Math Seminar, London, UK 2024.05

International Centre for Pension Management, Toronto, Canada	2024.03
LSE Joint Risk and Stochastics and Financial Math Seminar, London, UK	2024.02
Oxford–Man Institute of Quantitative Finance, Oxford, UK	2024.01
Institut de Science Financière et d'Assurances, Université Lyon 1, Lyon, France	2024.01
CMAP–CREST Quant Sustainable Econ and Finance Seminar, Paris, France	2024.01
Peking University Math School Colloquium, Beijing, China	2023.12
Chinese Academy of Sciences, AMSS, Beijing, China	2023.11
Beihang University, Beijing, China	2023.04
China Europe International Business School, Shanghai, China	2023.04
Oxford Statistics and Machine Learning in Finance Seminar, Oxford, UK	2023.04
University of Washington Seminar Course on Financial Math, Seattle, WA, USA	2023.04
National Engineering Lab for Big Data Analysis and Applications, Beijing, China	2023.03
HKUST-Guangzhou FinTech Thrust, Guangzhou, China	2022.11
IFZ FinTech Colloquium, Luzern, Switzerland	2022.11
UC Berkeley IEOR, Berkeley, CA, USA	2022.10
Soochow University Center for Financial Engineering, Suzhou, China	2022.09
Collective Intelligence Launch Event, New York, NY, USA	2022.09
BlackRock Research Brown Bag Series, New York, NY, USA	2022.05
University of Washington Financial Engineering Seminar, Seattle, WA, USA	2022.04
Cardiff University OR/Statistics Seminar, Cardiff, UK	2022.03
International Association for Quantitative Finance webinar, New York, NY, USA	2022.02
University of Hong Kong, Hong Kong, China	2020.03
NYU Department of Finance and Risk Engineering, New York, NY, USA	2019.01
Nankai University, Tianjin, China	2018.07

Teaching

PKU, Statistical Methods for Finance — Spring 2022, 2023, 2024
Core Class For Graduate Students, Instructor. Ratings: 97.64, 94.66, 97.12 (out of 100).

PKU, Introduction to Financial Mathematics — Fall 2022, 2023
Core Class For Undergraduate Students, Instructor. Ratings: 92.65, 85.79 (out of 100).

PKU, Fixed Income Markets — Fall 2023
Elective Class For Graduate Students, Instructor. Ratings: 98.75 (out of 100).

PKU, 3+X Seminar in Financial Mathematics — Fall 2021, 2022, 2023, 2024
Elective Research Seminar For Undergraduate Students, Co-Instructor

MIT, Undergraduate Research Opportunities Program (UROP) — 2014–2015
Research Mentor, (Topic: A Study on Risk Preference and Decision Making.)

MIT, Dynamic Programming and Stochastic Control — 2012, 2013
Elective For Graduate Students, Grader

MIT, Summer Program in Undergraduate Research (SPUR) — 2012
Research Mentor, (Topic: Least Absolute Deviations Method For Sparse Signal Recovery.)

Students

Doctoral Students

- Chaoyi Zhao. Thesis: Stochastic Models and Statistical Analysis for High-dimensional Multi-factor Models and Induced Order Statistics. 2024.01
  - Best Dissertation Award from Peking University.
  - First Position: PostDoc at MIT.
- Yumin Xu (since 2023.9). Topic: reinforcement learning, diffusion models, algorithmic collusion.
- Ziyue Yu (since 2023.9). Topic: green investing, factor models.
- Binnan Wang (since 2024.9). Topic: path signature, statistical properties of machine learning.
- Qiahao Zheng (since 2024.9). Topic: generative modeling, machine learning.
- Minghao Liu (since 2025.9). Topic: quantitative trading, algorithmic collusion.

Master's Students (graduated)

- Renzhuo Huang, Shuodong Huang, Jiaxin Li, Ye Tan, Minghui Yu 2024.07
- Yifei Fan, Yixin Fu, Jiadi Ge, Zhanxiang Peng, Fangzhou Tong, Huanxiong You, Peishan Yu, Ziyue Yu 2023.07

Undergraduate Students (graduated, supervised research projects)

- Binnan Wang, Qichuan Yin, Lujing Zhang, Jia Yi, Rui Rao, Yuming Yang, Jiawei Xue, Zixiuji Wang, Jianning Li, Ruichen Wang 2024.07
- Jingbin Zhuo, Baiming Lang, Bang Zhou 2023.07

Academic Services

Conference and Seminar Organizations

- Organizing committee, 2024 IEEE Symposium on Computational Intelligence for Financial Engineering and Economics (CIFEr), New York, NY, USA 2024.10
- Program committee, 2024 Financial Management Association (FMA) Annual Meeting, Grapevine, TX, USA 2024.10
- Program committee, ACM International Conference on AI in Finance (ICAIF), New York, NY, USA 2023.11, 2024.11
- Organizing Committee, Beijing International Center for Mathematical Research Workshop on Mathematical Finance and Insurance, Beijing, China 2024.04
- Organizing committee, China Joint Statistical and Data Science Meeting, Beijing 2023.07
- Organizing committee, PKU-NUS Annual International Conference on Quantitative Finance and Economics, China 2022.05, 2023.05, 2024.05, 2025.05
- Organizing committee, Inaugural Conference of the CSIAM Activity Group of Financial Technology and Algorithm, Zhuhai, China 2022.01
- Session chair, INFORMS Annual Meetings, USA 2022.10, 2023.10, 2024.10
- Session chair, 10th International Congress on Industrial and Applied Mathematics (ICIAM), "Climate Risks: From Modelling to Applications", Tokyo, Japan 2023.08
- Session chair, SIAM Conference on Financial Mathematics and Engineering (FM23), "Climate Risk Modelling and Green Investing", Philadephia, USA 2023.06

Community and University Services

- Deputy chair, Department of Financial Mathematics, School of Mathematical Sciences, Peking University 2021–Present
- Board member, China SIAM Activity Group of FinTech and Algorithm 2022–Present
- Board member, National Industrial Statistics Research Association 2023–Present
- Board member, China Association of Actuaries 2022–Present
- Academic Committee, American Statistical Association (ASA) section on statistical learning and data science (SLDS) student paper competition 2019–2020
- Voting Committee, 2024 China Finance Review International (CFRI) Literati Awards 2024

Editorial Boards

- Digital Finance 2025–present
- International Journal of Financial Engineering 2024–present

Referee Service

- Operations Research, Management Science, Journal of the American Statistical Association, Mathematical Finance, Journal of Economic Dynamics and Control, Mathematics and Financial Economics, Annals of Operations Research, IISE Transactions, European Financial Management, Journal of Empirical Finance, Expert Systems with Applications, Mathematical Reviews, Communications in Mathematics and Statistics, Frontiers of Mathematics, Scientific Reports, Financial Analyst Journal, Journal of Risk, The Journal of Impact & ESG Investing.

Academic Membership

- INFORMS, SIAM, CSIAM, AFA, WFA, EFA, Econometric Society, Society of Financial Econometrics, Commodity and Energy Markets Association