Chaoyi Zhao

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Research Interests

Investments: Factor investing, High-frequency investing/trading, Sustainable investing
Statistics: High-dimensional statistics, Machine learning & deep learning
Actuarial Sciences

Education

Peking University — Beijing, China
Ph.D. Candidate in Statistics   Supervisor: Prof. Lan Wu — 2019 – Present

Peking University — Beijing, China
B.S. in Mathematics and Applied Mathematics — 2015 – 2019
B.S. (Double Degree) in Computer Science and Technology — 2016 – 2019
Elite Undergraduate Program of Applied Mathematics — 2017 – 2019

Honors

Awards

S&P Global Academic ESG Research Award	2022
Second place in the Best Paper Prize for Young Scholars, Annual Conference of the Operations Research Society of China (Financial Engineering and Risk Management Branch)	2022
Merit Student	2016, 2020, 2021, 2022
Excellent Graduate of Elite Undergraduate Program of Applied Mathematics	2019
Peking University Excellent Graduate, Beijing Outstanding Graduate	2019
The Student of The Year (10 students per year)	2018
Merit Student Pacesetter	2018
Beijing Merit Student	2018
Excellent Student Leader	2017

Scholarships

President Scholarship	2019 – 2023
Leo KoGuan Scholarship	2022
Huatai Science and Technology Scholarship	2021
CETC the 14th Research Institute Glarun Scholarship	2020
National Scholarship	2018
The National Southwest Associated University Scholarship	2018
Shenzhen Finance Institute Scholarship, the Chinese University of Hong Kong, Shenzhen	2017
Founder Scholarship	2016

Publications

#Alphabetical order; *Corresponding author.

Factor Investing

1. Breaking the Factor Zootopia: Factor Selection via Significant Tests of Multi-Task Lasso
   Chaoyi Zhao* and Lan Wu.
   Working Paper.

High-Frequency Investing/Trading

2. High-Frequency Liquidity in the Chinese Stock Market: Measurements, Patterns, and Determinants
   Ruixun Zhang, Chaoyi Zhao*, Yufan Chen, Lintong Wu, Yuehao Dai, Ermo Chen, Zhiwei Yao, Yihao Zhou, and Lan Wu.
   Under review. [SSRN]
3. Order Types and Natural Price Change: Model and Empirical Study of the Chinese Market
   Siyu Liu, Chaoyi Zhao*, and Lan Wu.
   International Journal of Financial Engineering, 9(04), 2250033, 2022. [Journal]

Sustainable Investing

4. 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), 55-93, 2022. [PDF][Journal]
   Winner of the S&P Global Academic ESG Research Award.
   Reported by Center for Statistical Science and School of Mathematical Sciences, Peking University.
5. Optimal Impact Portfolios with General Dependence and Marginals
   Andrew W. Lo#, Lan Wu#, Ruixun Zhang#, and Chaoyi Zhao#*.
   Working paper. [SSRN]
   Second place in the Best Paper Prize for Young Scholars, Annual Conference of the Operations Research Society of China (Financial Engineering and Risk Management Branch).

Machine/Deep Learning and Their Applications in Finance

6. On Consistency of Signatures Using Lasso
   Xin Guo#, Ruixun Zhang#, and Chaoyi Zhao#*.
   Under review. [arXiv]
7. Channel and Spatial Attention CNN: Predicting Price Trends from Images
   Ruixun Zhang, Guanglian Lin, and Chaoyi Zhao.
   Under review. [SSRN]
8. The Success of AdaBoost and its Application in Portfolio Management
   Yijian Chuan, Chaoyi Zhao, Zhenrui He, and Lan Wu.
   International Journal of Financial Engineering, 8(02), 2142001, 2021. [Journal]

Actuarial Sciences

9. Construct Smith-Wilson Risk-Free Interest Rate Curves with Endogenous and Positive Ultimate Forward Rates
   Chaoyi Zhao*, Zijian Jia, and Lan Wu.
   Under review.

Books

10. Quantitative Investing (in Chinese)
    Jian Sun, Lan Wu, and Chaoyi Zhao.
    Science Press, Forthcoming.
11. Financial Market Risk Management Analytics (in Chinese)
    Frank H. Koger. Translated by Chaoyi Zhao.
    Truth & Wisdom Press, 2022.
12. The Maths Book (in Chinese)
    Dorling Kindersley Ltd. Translated by Chaoyi Zhao.
    Publishing House of Electronics Industry, 2021. [Link]

Research Projects

High-Frequency T+0 Quantitative Trading Strategy Based on Deep Learning
Peking University and Founder Securities 2019 – 2020

Gradient Optimization Model Based on Genetic Programming
Ernst & Young (China) Advisor Ltd 2019

Multi-Factor Alpha Strategy Based on the AdaBoost Algorithm
Peking University and Founder Securities 2018 – 2019

Application of Statistical Learning in Modeling the Relationship Between Stock Index and Futures
Undergraduate Research, Peking University 2017 – 2018

Teaching Experience

Teaching Assistant for Peking University
Quantitative Trading Fall 2020, 2022
Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Jian Sun and Lan Wu
Practice for Fixed Income Securities Fall 2021, 2022
Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Lan Wu *et al.*
Theory and Practice for Futures and Other Derivatives Spring 2022
Elective for Graduate and Senior Undergraduate Students. Instructor: Prof. Lan Wu *et al.*
Mathematical Analysis III (Including Exercise Class) Fall 2021
Core Class for Undergraduate Students. Instructor: Prof. Jiazhong Yang
Mathematical Analysis II (Including Exercise Class) Spring 2021
Core Class for Undergraduate Students. Instructor: Prof. Jiazhong Yang
Risk Management and Financial Regulation Spring 2021
Core Class for Graduate Students. Instructor: Prof. Lan Wu
Exercise Class for Probability and Statistics Spring 2020
Elective for Undergraduate Students.

Introduction to Financial Mathematics Fall 2019
Core Class for Undergraduate Students. Instructor: Prof. Lan Wu

Teaching Assistant for Master Program of Tulane University & University of Chinese Academy of Social Sciences

Fixed Income Analysis 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Bill W. Reese

Investment and Asset Pricing 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Frank H. Koger

Risk Management 2019, 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Frank H. Koger

Options and Other Derivatives 2019, 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Paul A. Spindt and Josh Pierce

Valuation 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Peggy Huang

Portfolio Management 2020, 2021
Core Class for Graduate Students. Instructor: Prof. Helmuth Chavez

Talks

On Consistency of Signatures Using Lasso

UC Berkeley Seminar May 7, 2023
Invited talk.

Breaking the Factor Zootopia: Factor Selection via Significant Tests of Multi-Task Lasso

7th PKU-NUS Annual International Conference on Quantitative Finance and Economics May 20, 2023
Speaker of the Financial Modelling I Session.

PKU Seminar April 21, 2023
Invited talk.

CSIAM Financial Math Annual Conference November 13, 2022
Speaker of the FinTech Session. [Link]

Optimal Impact Portfolios with General Dependence and Marginals

ICIAM 2023 @ Tokyo August 20–25, 2023
Speaker of the Climate Risks: From Modelling to Applications Session. [Link]

The 11th Annual Conference of the Operations Research Society of China (Financial Engineering and Risk Management Branch) December 10, 2022
Speaker of the Best Paper Prize for Young Scholars II Session. [Link]
Second place in the Best Paper Prize for Young Scholars.

Sun Yat-sen University Seminar November 4, 2022
Invited talk.

The 19th Chinese Finance Annual Meeting October 30, 2022
Speaker of the ESG session. [Link]

High-Frequency Liquidity in the Chinese Stock Market: Measurements, Patterns, and Determinants

CSIAM Financial Math Annual Conference November 12, 2022
Speaker of the FinTech Session. [Link]

IFZ FinTech Colloquium 2022, Lucerne University of Applied Sciences and Arts November 2, 2022
Speaker. [Link]

2022 INFORMS Annual Meeting October 17, 2022
Speaker of the FinTech Session. [Link]
11th World Congress of Bachelier Finance Society June 15, 2022
Session chair and speaker of the Market Microstructure II Session. [Link]

Statistical Patterns of High-Frequency Data for A-share stocks in Shenzhen Stock Exchange
3rd Seminar for Young Scholars in Financial Engineering and Risk Management June 12, 2021
Invited talk. [Link]

Construct Smith-Wilson Interest Rate Curves with Endogenous Ultimate Forward Rates
United As One: 24th International Congress on Insurance: Mathematics and Economics June 5, 2021
Speaker of the Quantitative Finance session. [Link]

Speech for the Opening Ceremony of School of Mathematical Sciences
Opening Ceremony, School of Mathematical Sciences, Peking University September 15, 2018
Representative of seniors. [Link]

Skills

Programming: Python, C/C++, MATLAB, R, Java, SQL
Languages: Chinese, English, Chinese sign language
Hobbies: Swimming, Ukulele