

Jiayou Liang

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Summary

Jiayou Liang with a strong academic background in Applied Data Science and Financial Mathematics. Building expertise in implementing machine learning models, predictive analytics, and natural language processing to solve complex problems. Gaining experience in financial modeling, optimizing portfolios through data-driven approaches, and analyzing stock performance using sentiment analysis. Proficient in Python, R, and MATLAB, with working knowledge of C++ and a growing focus on applying these skills in financial technology and quantitative analysis. Eager to contribute to impactful projects and drive data-driven solutions through continued learning and hands-on experience.

EDUCATION BACKGROUND

The University of Chicago

Chicago, IL

- **Program:** MS in Applied Data Science **GPA:** 4.0/4.0 Expected 12/2025
- **Coursework:** Machine Learning and Predictive Analytics, Big Data Platforms, Data Science for Consulting

Beijing Normal University–Hong Kong Baptist University United International College (UIC)

Zhuhai, China

- **Degree:** Bachelor of Science (Honours) in Financial Mathematics 09/2020–06/2024
- **Major:** Financial Mathematics **GPA:** 3.77/4.0
- **Honors and Awards:**
 - First Class Award (12/2021, 12/2022), President's Honor Roll (every semester)
 - Third Prize in Guangdong Division of China Undergraduate Mathematical Contest in Modeling (CUMCM, 10/2022)
 - Successful Participant in MCM/ICM (04/2021, 05/2022, 05/2023, 07/2023)

University of Oxford

Online

- **Summer course:** Artificial Intelligence and Machine Learning (Grade: A) 08/2022

RESEARCH EXPERIENCE

Paper in progress: Analyst Reports and Stock Performance: Evidence from the Chinese Market 10/2022–present

- **Role:** Co-author (Rui Liu, [Jiayou Liang](#), Haolong Chen and Yujia Hu)
- **Responsibilities:** article writing, model construction, programming
- **Abstract:** This article applies natural language processing (NLP) to extract and quantify textual information for the prediction of stock performance. Leveraging an extensive dataset of Chinese analyst reports and employing a customized BERT deep learning model for Chinese text, this study categorizes the sentiment of the reports as positive, neutral, or negative. The findings underscore the predictive capacity of this sentiment indicator for stock volatility, excess returns, and trading volume. Specifically, analyst reports with strong positive sentiment will increase excess return and intraday volatility, and vice versa, reports with strong negative sentiment also increase volatility and trading volume, but decrease future excess return. The magnitude of this effect is greater for positive sentiment reports than for negative sentiment reports. This article contributes to the empirical literature exploring sentiment analysis and the response of the stock market to news on the Chinese stock market;
- **Doi:** <https://arxiv.org/abs/2411.08726>

Paper: Is there salary discrimination by race and nationality in the NBA? A new approach 10/2022–03/2023

- **Role:** Team leader, lead programmer, and the first author ([Jiayou Liang](#), Shuaijie Zhao, Haoyuan Zhu)
- **Responsibilities:** data acquisition, code writing, and drafting the explanation for our regression variables;
- **Achievement:** accepted by The 7th International Conference on Economic Management and Green Development (ICEMGD 2023)
- **Abstract:** This study seeks to investigate the existence of salary discrimination in the National Basketball Association (NBA). According to Gary Becker's theory of discrimination in labor economics, this study focuses on employer discrimination. While previous research has examined discrimination based on race and nationality separately, this paper combines them to analyze the issue comprehensively. Specifically, the study focuses on whether salary discrimination occurs among American-white, American-nonwhite, other country-white, and other country-nonwhite individuals. Therefore, based on the data collected from Basketball Reference for the 2021–2022 season, a Mincer equation has been constructed to predict the effect of experience, race, nationality, and players' performance on earnings. The OLS regression result provides evidence that there was no such race or nationality discrimination in NBA.

Paper: Real Option Approach and Multi-Stage Fuzzy Decision-Making System for IP Valuation 04/2022–06/2023

- **Role:** Co-author (Rui Liu, Qile Li and [Jiayou Liang](#))

- **Responsibilities:** article writing;
- **Achievement:** **accepted** by the 2nd International Conference on Financial Innovation, FinTech and Information Technology (FFIT 2023);
- **Abstract:** This article delves into the pricing of intellectual property (IP) valuation and proposes the Real Option Approach (ROA) as a suitable method. Drawing on an overview of previous research on ROA, IP pricing, and fuzzy inference systems, a FIS approach is introduced to optimize real options. This approach utilizes a multi-stage fuzzy decision-making system comprising 15 variables and 11 fuzzy decision-making rules. The patent is considered an asset that requires commercialization and has the potential to generate positive cash flow after the development process. By establishing underlying distributions of parameters, simulation results demonstrate the system's stability when provided with input values;
- **Doi:** <http://dx.doi.org/10.4108/eai.7-7-2023.2338056>

PROJECTS

Cross-Impact-Analysis-of-Order-Flow-Imbalance-OFI, Programmer **12/2024-01/2025**

- This project investigates Order Flow Imbalance (OFI) cross-impact in equity markets using high-frequency data from 5 Nasdaq 100 stocks across different sectors (AAPL, AMGN, TSLA, JPM, XOM). The analysis involves:
 1. Computing multi-level OFI metrics up to 5 levels of the limit order book
 2. Using PCA to integrate multi-level OFIs into a unified metric
 3. Analyzing contemporaneous and lagged cross-asset impacts on price changes
 4. Evaluating predictive power at 1-minute and 5-minute horizons
- GitHub: [rickliang-JY/Work-Trial-Task-Cross-Impact-Analysis-of-Order-Flow-Imbalance-OFI-](https://github.com/rickliang-JY/Work-Trial-Task-Cross-Impact-Analysis-of-Order-Flow-Imbalance-OFI-)

Least Squares Monte Carlo Method and Neural Network Regression for Valuation of Guaranteed Minimum Withdrawal Benefit, Programmer **03/2024-12/2024**

- Python is used to apply the least squares Monte Carlo method and neural network regression to evaluate the GMWB.
- The results of sensitivity analysis show the consistency between this pricing method and the actual market, it also shows the stability of neural network regression on pricing GMWB.

Black-Litterman Model with Investors View in Back Testing, Team Leader **04/2024-06/2024**

- This project uses backtesting to demonstrate that the Black-Litterman model, which incorporates investor views, achieves higher returns and often reduced volatility compared to the traditional Markowitz model. By integrating personalized market insights, backtesting results show that the Black-Litterman model enables more tailored and responsive portfolio optimization.

Final Year Project: Examining the Impact of Macroeconomic Variables on the Correlation Between Carbon, Clean Energy, and CRB Markets: Insights from GARCH-MIDAS and DCC-MIDAS Models, Team Leader **06/2023-12/2023**

- Investigated how the macroeconomic factors have affected the long-term correlation between the carbon-clean, carbon-industrial spot price and their volatility using GARCH-MIDAS and DCC-MIDAS models.

Risk Management: Optimal Portfolio Based on Machine Learning, Team Leader and Programmer **04/2023-05/2023**

- Optimized Mean-Variance Portfolio and Mean-CVaR Portfolio with approaches of historical simulation, weighting of observations, volatility scaling for market variables, bootstrap method, Monte Carlo simulation, and model-building;
- Built models based on machine learning: LSTM model for prediction, and Black-Litterman model for choosing weight.

Numerical Analysis: Barrier options under Monte Carlo Pricing, Model Construction and Programmer **11/2023-12/2023**

- Employing the Monte Carlo method under the Black-Scholes model and Schöbel-Zhu stochastic volatility model to simulate the price of 8 barrier options.
- Conducting a sensitivity analysis of how changes in key parameters like λ in the stochastic model affect pricing.

INTERNSHIP EXPERIENCE

Exion Asia (Huizhou) Co., Ltd, Assistant for Marketing and Sales Analysis **06/2023-08/2023**

- Involved in the comprehensive analysis of sales trends, market share distribution, and competitive dynamics in the industrial sector;
- Used diverse data analysis tools and techniques to analyze large datasets and derive key insights and patterns.

Bank of Communications Huizhou Branch, Customer Service Manager **06/2022-07/2022**

- Guided customers in their banking services