Hongzhen Du

Email: hongzhen.du19@student.xjtlu.edu.cn Mob: +86-156-2646-9897 Website: https://rodridu.github.io/

EDUCATION

Xi'an Jiaotong-Liverpool University
Bachelor of Economics | Finance Track Jul 2023 (Expected)
- **GPA**: 3.74/4.00; **Major GPA**: 3.85/4.00 **Rank:** 6/121
- **Math Coursework**: Probability and Statistics, Mathematical Economics, Econometrics, Real Analysis, Game Theory, Stochastic Calculus, Financial Mathematics, Financial Engineering.
- **Economic & Finance Coursework:** Microeconomics, Macroeconomics, Mathematical Economics, Financial Management, Corporate Finance, Chinese Economy, Environmental Economics, Asset Pricing (PhD).
- **Honors:** University Academic Achievement Award (2022, Top 5%), Continuing Academic Merit Scholarship (Top 10%)

University of Chicago
Summer Visiting Student Jun 2022 - Aug 2022
- Coursework: Quantitative Portfolio Management & Algorithmic Trading

National University of Singapore
Summer Computing Workshop Student May 2022 - Jul 2022
- Research Topic: Machine Learning / Artificial Intelligence in Financial Services

Imperial College London
Winter School Student Jan 2022 - Feb 2022
- Coursework: Computer Vision and Natural Language Processing

PROFESSIONAL EXPERIENCE

GF Securities | Over-The-Counter Department Jun 2022 - Aug 2022
Quantitative Analyst Intern
- Built an **alpha equity model** by fundamental factors including ROE, monthly turnover and year-to-year growth and constructed portfolio by opening position in equities with highest return at each industry, achieving 12% excess return.
- Constructed a **pairs trading strategy** by finding the highest correlated stocks of Top 5 industries in CSI 500 index of past 5 years through ADF test and correlation analysis, resulting in 11% maximum drawdown and highest Sharpe ratio of 1.88.
- Constructed an **indicator to determine the bull and bear markets** by volatility and turnover rate between 2010 and 2019 and utilized a double moving average strategy for market timing, which achieved better Sharpe Ratio than CSI500.
- Classified anti-money laundering rating messages by subject keywords in Python and achieved an accuracy of 90%.

Orient Securities | Asset Management Department Jul 2021- Aug 2021
ABS Investment Intern
- Conducted data collection, cleaning and visualization of MBS and ABS products; analyzed financial statements to write 4 in-depth recommendation reports on companies in the Li-ion battery and new energy industry.
- Applied an Excel function plug-in in WIND to collect ABS information; composed a VBA program to automate format conversions and data filling, promoting the department's efficiency by 30%.

RESEARCH EXPERIENCE

Clustering and Machine Learning in Option Pricing | *Undergraduate Dissertation* Nov 2022 - Now
- Executed the K-Means algorithm for Black-Scholes model variables in 3 sub-period before option pricing simulation to analyze the clustering phenomenon of S&P500 data; revealed possible market regime shifts during COVID-19 pandemic**.**
- Compared option pricing errors between Neural Networks, Random Forest and XGBoost with data between 2018 and 2022.

Machine Learning Application in Multi-factor Portfolio Management | *Individual Research* Oct 2022 - Nov 2022
- Performed standardization on HSI300 raw data between 2005 and 2022, **Conducted LASSO and Ridge regression analysis** on 40+ profitability, technical and quality factors to screen out 5 optimal with best performance.
- **Constructed factor-weighted long-short portfolios** in Python; backtested 4 strategies with different stock amount held over the same period between 2017 and 2022; revealed that holding 100 stocks achieves largest annualized return of 8%.

Textual Analysis and Machine Learning in Predicting Stock Prices | *Project Leader* Jun 2022 - Jul 2022
National University of Singapore Summer Computing Workshop, Advisor: ***Prof. Anand Bhojan***
- Calculated weighted average sentiment scores of news and constructed a sentiment dictionary adapted for return prediction.
- Trained an LSTM model with 5 dimensions and 50 epochs to execute rolling sentiment and stock price forecast for CSI300 index; achieved an out-sample accuracy greater than 92%

Regression Analysis of Money Supply's Impacts in Turkey | *Individual Research* Mar 2022 - Apr 2022
- **Constructed 6 distributional lag models** with different factors in STATA to test correlations and changes of dynamic cumulative multipliers between money supply, unemployment rate and real interest rate with data downloaded from Turkish Central Bank, and rejected the feasibility of applying monetary neutrality assumption on Turkish economic crisis over the last decade.

Policy analysis of Hong Kong and Thailand during the 1997 Financial Crisis | *Group Leader* Feb 2022 - Apr 2022

UChicago & PKU MPIF Capstone Project Excellence Award, Advisor: ***Prof. Dave Schabes*** *at University of Chicago*

- Examined the exchange rate systems under different choices in the monetary trilemma and presented connections dynamically between monetary policies and the movements of GDP and short-term interested rates.
- Analyzed the different reasons why the domestic currency overvaluation happened and how the current account deficit impacted the overall economy of Hong Kong and Thailand during the 1997 East Asian Financial Crisis and demonstrated the rationale of corresponding fiscal and monetary policies on economic conditions.

Word Representation in Biomedical Domain Under Natural Language Processing | *Group Leader*

Best NLP Project, Imperial College London Data Science Winter School Jan 2022 **-** Feb 2022

- Tokenized academic papers titles from CORD-19 corpus into words in Python; **exported the 10 most relevant words** co-occurred with "COVID-19" by comparing Pointwise Mutual Information (PMI).
- **Performed PCA** to reduce the exposed dimensions of word vectors; visualized 100 selected biomedical entities by t-SNE; filtered out the 10 most semantically similar entities by calculating cosine similarity**.**

Comparison between Domestic and Foreign Output Gap | *Research Assistant*

Supervisor: ***Prof. Syed Abbas*** *at Xi'an Jiaotong-Liverpool University* Oct 2021- Jan 2022

- Utilized HP filters to **calculate output gap and potential output** through monthly and quarterly total trade, GDP and IPI statistics after data cleaning and exported datasets containing trade weights and output gap through STATA.

Risk Management Analysis for an Investment Strategy | *Group Member* May 2021 - Aug 2021

Summer Undergraduate Research Fellowships (SURF) at Xi'an Jiaotong-Liverpool University

- Exported the corresponding trading dates of the 5% VaR for daily returns for SP500, FTSE100 and HS300 via Excel, and **executed a buy-low-sell-high strategy** using MWRR using data from 2010 to 2014, achieving an annual return of 11%.
- Backtested the VaR of transaction days with abnormal accounting ratios through Christoffersen Test in R, with HSI300 and SP500 data between 2014 and 2019 after taking first-order difference, which verifies the effectiveness of the strategy.

Analysis and Forecast of the Chinese Stock Market Efficiency | *Research Volunteer* May 2020 - July 2020

- Tested the impact of anomalies, including month effect, holiday effect and day-of-week effect between 2005 and 2020 by ranking the mean, volatility, and Sharpe ratio of the Shanghai Composite Index each month in Excel.
- **Constructed a hedging portfolio** based on the average proportions of industries by holding long top 5 stocks and short last 5 stocks ranked by average shares in every 10 trading days and compared the performance with the index.

LEADERSHIP EXPERIENCE

LinkedIn (China) Global Business Challenge | *Project Leader* Oct 2021 - Nov 2021

- Coordinated a team of 5 to analyze the business situation of LinkedIn (China) after withdrawing social functions and organized the investigation regarding the feasibility of offering online professional courses with recognized certificates to bridge skill gaps.

Xi'an Jiaotong-Liverpool University Student-Staff Liaison Committee | *Student Representative* Feb 2021 - Jun 2021

- Analyzed 200+ students' feedback on 4 different levels of Spanish courses and proposed a mandatory virtual speaking practice plan with the module leader.

SKILLS AND OTHERS

Language: Chinese (Native), English (Fluent), Cantonese (Fluent), Spanish (Basic), Russian (Elementary)
Technical: Python, STATA, EViews, R, SQL, Wind, Bloomberg, Microsoft Office, LaTeX
Interests: Traveling (180+ Cities), Urbex (30+ Sites), Fan Mail (600+ Replies), Stage Play (Club Leader), Trainspotting.
Open Courseware Certificates: Deep Learning (DeepLearning.AI), Financial Engineering and Risk Management (Columbia), Python and Statistics for Financial Analysis (HKUST), Reinforcement Learning in Finance (NYU), Python and Machine Learning for Asset Management (EDHEC), SQL for Data Science (UC Davis), Numerical Analysis (HSE University), Data Structures (UCSD), Operational Research (NTU), C++ For C Programmers, Part A (UCSC)