

MENGZHE RUAN

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🎓 EDUCATION

City University of Hong Kong (CityU), Hong Kong, China 2020.8 – Present

Ph.D. student in Computer Science (CS)

Expected graduate in Jun. 2025, Supervisor: Dr. Weitao XU

Sichuan University, Sichuan, China 2016.9 – 2020.6

Bachelor Degree in Computer Science (CS) and Financial Engineering (FE)

Computational Finance Experimental Class in *Wu Yuzhang Honors College*

📄 CONFERENCE

Optimal Power Control for Over-the-Air Federated Learning with Gradient Compression

Mengzhe Ruan, Yunhe Li, Weizhou Zhang, Linqi Song, Weitao Xu

Accepted by The International Conference on Parallel and Distributed Systems (ICPADS 2024)

Adaptive Top-K in SGD for Communication-Efficient Distributed Learning

Mengzhe Ruan, Guangfeng Yan, Yuanzhang Xiao, Linqi Song, Weitao Xu

Presentation on IEEE Global Communications Conference: Communication Theory (GLOBECOM 2023)

📄* JOURNAL

Adaptive Top-K in SGD for Communication-Efficient Distributed Learning in Multi-Robot Collaboration

Mengzhe Ruan, Guangfeng Yan, Yuanzhang Xiao, Linqi Song, Weitao Xu

Accepted by IEEE Journal of Selected Topics in Signal Processing (JSTSP), Extension of Globecom 2023.

mmSign: mmWave-based Few-Shot Online Handwritten Signature Verification

Mingda Han, Huanqi Yang, Tao Ni, Di Duan, Mengzhe Ruan, Yongliang Chen, Jia Zhang, Weitao Xu

ACM Transactions on Sensor Network (ToSN, CCF B)

📄 PREPRINT & UNDER REVIEW

Gradient Decoupling: A Plug-and-play Framework for Accelerating General Federated Learning

Bridging the Data Scarcity Gap via Knowledge Transfer in Offline Reinforcement Learning

Submitted to The 42nd International Conference on Machine Learning (ICML 2025)

👤 WORKING (INTERN) EXPERIENCE

Corporate Development Department (Hubble Technology Investment), Huawei Technologies Co., Ltd., Shenzhen, China 2024.7 – 2024.12

Technology Investment Analyst Intern

Brief introduction: Technology insights and investment analysis in the software and artificial intelligence field.

1. Industry and Company Research: Conducted in-depth research and analysis on data platforms (e.g. Databricks, Snowflake), including market positioning, technological advantages and business models, which provided data support for the later investment decisions. Also analyzed the investment situation of Databricks and conducted in-depth analysis and investigation on the companies it has invested in to infer future development directions and output an insight report.

2. Technical Insight: Conducted detailed research and analysis on the technological development in the field of synthetic data, identified key technological trends and potential growth opportunities. Conducted technical insight and analysis on emerging enterprises in the field of synthetic data and evaluated their market potential and technological innovation.

3. Macro Research: Collected, sorted out and analyzed the investment situation in Singapore and Spain starting from 2023. Also paid attention to the investment situation of Singaporean university incubators. Initially sorted it out into documents and conducted simple understanding and summary.

Qilin Investment (AUM about 20-30 billion CNY), Shanghai, China

2024.2 – 2024.3

Quantitative Researcher Intern (Machine Learning)

Brief introduction: Utilizing the company's powerful factor library, we have intensively researched and experimented with a variety of deep learning architectures, mainly including Recurrent Neural Networks (RNN) and Transformer models, focusing on time series forecasting.

1. Model Optimization: By adjusting the model structure and hyper-parameter optimization (e.g., time step, number of network layers), we have significantly improved the performance of the forecasting model.

2. Performance Improvement: In a simulated trading environment, a novel stock return forecasting model was successfully designed and implemented, which achieved a long-short return (LSPnL) enhancement of about 15%, outperforming the previous benchmark model, while the information coefficient (IC) remained stable.

2012 Labs, Huawei Technologies Co., Ltd., Hangzhou, China

2023.11 – 2024.2

AI (Machine Learning) Engineer Intern

Brief introduction: In-depth study of distributed aggregate communication algorithms, such as NCCL, analyzing their code structure and algorithm design, focusing on their GPU topology analysis in large-scale deep learning training, and attempting to optimize them.

1. Algorithmic research: In-depth analysis of Parameter Server architecture algorithms (e.g., BytePS), combined with gradient compression techniques, can significantly reduce the communication latency and improve the data transmission efficiency.

2. Academic contribution: systematically organize and summarize the latest research results on high performance networking and distributed computing in top conferences such as SIGCOMM and HiPC, which provide references for further research in the lab.

COMPETITION EXPERIENCE

The Fourth Place

Infinity Champions 011 - Alphathon 2023 WORLDQUANT

Develop and submit 32 Alphas with Sharpe above 1.25 and Turnover rate within 70%, based on the Top 3000 stock Universe of USA and China totally.

National Second Prize

2018 China Undergraduate Mathematical Contest in Modeling

Meritorious Winner

2018 MCM/ICM (Mathematical Contest in Modeling/ Interdisciplinary Contest in Modeling)

HONORS AND AWARDS

Gold Level (About Top 1%) in WORLDQUANT Brain Challenge

Until Dec. 2023

Individual First-Class Scholarship, Sichuan University

2018 – 2019

Postgraduate Studentship by UGC, City University of Hong Kong

2020 – 2024

TEACHING EXPERIENCE

Teaching Assistant

CityU, CS1302 Introduction to Computer Programming, 2020.9- Now

This course is mainly about Python programming, I was the Teaching Tutor for 4 semesters and the Teaching Assistant for 3 semesters.