Yuzhe (Toby) Yang

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Education

School of Data Science, The Chinese University of Hong Kong, Shenzhen — Shenzhen, China
B.Eng. in Computer Science and Engineering — *Sep. 2021 – May 2025*

Selected Courses

Parallel Programming *(PhD Level)*, Natural Language Processing *(PhD Level)*, Large Language Model *(PhD Level)*, Design and Analysis of Algorithms, Operation Systems, Computer Architecture, Optimization, Data Structures

Research Interests

Language Model: Human-Machine Interaction, Agent System, AI for Scientific Applications, Trustworthy NLP
Data Mining: Social Computing, Spatial-Temporal Modeling

Publications

TwinMarket: A Scalable Behavioral and Social Simulation for Financial Markets [online]
Yuzhe Yang*, Yifei Zhang*, Minghao Wu*, Kaidi Zhang, Yunmiao Zhang, Honghai Yu, Yan Hu, Benyou Wang
Best Paper Award, ICLR 2025 Workshop on Advances in Financial AI.

UCFE: A User-Centric Financial Expertise Benchmark for Large Language Models [online]
Yuzhe Yang*, Yifei Zhang*, Yan Hu*, Yilin Guo, Ruoli Gan, Yueru He, Mingcong Lei, Xiao Zhang, Haining Wang, Qianqian Xie, Jimin Huang, Honghai Yu, Benyou Wang
In Findings of the Association for Computational Linguistics: NAACL 2025, pages 5429–5448.

Open-FinLLMs: Open Multimodal Large Language Models for Financial Applications [online]
Jimin Huang, Mengxi Xiao, Dong Li, Zihao Jiang, Yuzhe Yang, Yifei Zhang, Lingfei Qian, Yan Wang, Xueqing Peng, et al.
arXiv preprint arXiv:2408.11878. 2024 Aug 20.

FAST-CA: Fusion-based Adaptive Spatial-Temporal Learning with Coupled Attention for airport network delay propagation prediction [online]
Chi Li, Xixian Qi, Yuzhe Yang, Zhuo Zeng,Lianmin Zhang, Jianfeng Mao
Information Fusion. 2024 Jul 1;107:102326.

(* Equal Contribution)

Research Experience

Large-scale Social Simulation Agent — Oct. 2024 – Jan. 2025
Advised by Prof. Benyou Wang & Prof. Honghai Yu — *CUHK-Shenzhen & Nanjing University*

- Developed the TwinMarket framework where LLM agents simulate large-scale human investor behaviors to validate economic principles and market theories, leveraging the TwinMarket framework to model individual decision-making and social interactions.
- Built scalable simulations to evaluate how collective trading behavior impacts broader market outcomes, successfully replicating key market phenomena such as volatility clustering and fat-tailed return distributions.
- This work won the Best Paper Award at *ICLR Workshop 2025*

Financial Multimodal Large Language Model — May. 2024 – Oct. 2024
Advised by Prof. Benyou Wang & Jimin Huang — *CUHK-Shenzhen & TheFinAI*

- Leaded the multimodal extension of LLM
- Developed a multimodal financial benchmark dataset for LLM training and evaluation
- Multimodal instruction finetuning for LLM, include text, image (chart & tabular) and numerics data
- Align multimodal LLM with financial data and real-world scenarios to improve model performance
- Released FinLLaVA-8B: Achieved MMMU (Overall) score of 36.3 and MMMU (Business) score of 30.7

- Constructed a purely text-based multi-turn dialogue benchmark to evaluate the performance of LLMs in real-world financial applications using a user simulator; this work had accepted to *NAACL Findings 2025*; #1 Paper of the day on Hugging face

Flight Delay Propagation Modeling Aug. 2023 – Sep. 2024

Advised by Prof. Jianfeng Mao *CUHK-Shenzhen*

- Developed a GNN framework integrating dynamic and adaptive graph learning with coupled attention mechanisms to address complex spatial-temporal dependencies in airport delay propagation; this work had published in *Information Fusion*
- Enhanced the SIS epidemiological model by incorporating adaptive graph learning to simulate and predict epidemic transmission dynamics in airport networks; this work is in preparation, to be submitted to *Transportation Research Part B: Methodological*
- Leverages Neural ODE networks to improve flight delay prediction by developing a continuous graph model that enhances interpretability, reduces training time, and addresses challenges like irregular time sampling and missing data

Projects

Quant-GPT: Money is All You Need [online] | *PyTorch, Transformers, ChromaDB* Mar. 2024 – Apr. 2024

- Final project for the PhD course CSC6052, a multi-agent system for A-share market investment decisions
- Fine-tuned an LLM, integrating it with sentiment analysis and real-world market data.
- Utilized RAG and multi-agent systems to dynamically access and synthesize relevant financial news, enhancing the model's ability to forecast market trends and returns
- Results achieved: Sharpe Ratio: 0.40, Annualized Return: 7.26%, Max Drawdown: 13.61%

Travel Insurance Recommendation AI System [online] | *PyTorch, LangChain* Jan. 2024 – Apr. 2024

- Developed an AI system to predict flight delays and recommend personalized travel insurance
- Fine-tuned the LLM using an insurance corpus to improve domain-specific question-answering capabilities, achieving an 83% accuracy in identifying user intent
- Utilized deep learning and LLM agents for accurate delay predictions and customer sentiment assessment

Flight Information System [online] | *Python, LangChain, SQL, Flask* Mar. 2024 – Apr. 2024

- Developed database system to optimize airline management, including passenger bookings and flight logistics
- Delivered a functional database with a user-friendly web interface
- Integrated LLM to enhance database architecture and query generation

Work Experience

China Telecom Beijing Research Institute Jan. 2024 – Mar. 2024

Remote Internship *Beijing, China*

Shenzhen Branch of China Telecom Jan. 2024 – Apr. 2024

Part-time Internship *Shenzhen, China*

Technical Skills

Languages: Python, C/C++
Developer Tools: Git, Docker, Linux, Slurm
Libraries: PyTorch, Transformers

Awards

Best Paper Award at Advances in Financial AI Workshop @ ICLR 2025 2025
Travel Grant Award at Advances in Financial AI Workshop @ ICLR 2025 2025
Kaggle Silver Medal in AI Mathematical Olympiad - Progress Prize 2 2025
Undergraduate Research Award in CUHK-Shenzhen 2024, 2025
Outstanding College Contribution Award in CUHK-Shenzhen 2022

Service

Reviewer: IJCAI 2025, ICLR 2025 Workshop

Latest Version
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