Yuzhe Yang

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EDUCATION

The Chinese University of Hong Kong, Shenzhen Shenzhen, China

B.Eng. in Computer Science and Engineering *Sep. 2021 – May 2025*

Advised by: *Prof. Jianfeng Mao and Prof. Benyou Wang*

Research Interest:
- Data Mining: Spatial-Temporal Modeling, Time Series, Graph Learning
- Large Language Model: Multimodal Reasoning & Alignment, Hallucination, Agent
- Trustworthy AI

PUBLICATIONS

[1] **FAST-CA: Fusion-based Adaptive Spatial-Temporal Learning with Coupled Attention for airport network delay propagation prediction**

Li, C., Qi, X., **Yang, Y.**, Zeng, Z., Zhang, L., Mao, J., *Information Fusion.* 2024. P. 102326. [link]

[2] **Open-FinLLMs: Open Multimodal Large Language Models for Financial Applications**

Xie, Q., Li, D., Xiao, M., Jiang, Z., Xiang, R., Zhang, X., Chen, Z., He, Y., Han, W., **Yang, Y.**, Chen, S., Zhang, Y., Shen, L., Kim, D., Liu, Z., Luo, Z., Yu, Y., Cao, Y., Deng, Z., Yao, Z., Li, H., Feng, D., Dai, Y., Somasundaram, V., Lu, P., Zhao, Y., Long, Y., Xiong, G., Smith, K., Yu, H., Lai, Y., Peng, M., Nie, J., Suchow, J. W., Liu, X.-Y., Wang, B., Lopez-Lira, A., Huang, J., Ananiadou, S., *arXiv preprint 2408.11878.* 2024. [link]

Working Paper

[3] **Integrative Mean-Field Epidemic Model and Adaptive Graph Learning for Network-wide Delay Propagation Dynamics Prediction**

Li, C., Lei, M., Wu, J., **Yang, Y.**, Zhang, L., Mao, J., *To be submitted.* 2024

[4] **A User-Centric Financial Benchmark for Large Language Models**

Yang, Y., Zhang, Y., Gan, R., Wang, B., *To be submitted.* 2024

RESEARCH EXPERIENCE

Financial Multimodal LLM May. 2024 – Present

Research Assistant Internship, advised by Prof. Benyou Wang and Jimin Huang *SRIBD*
- Leaded a task team to the multimodal extension of LLM; this work had submitted to *KDD 2025* [2]
- 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 is currently ongoing [4]

Flight Delay Propagation Modeling Aug. 2023 – Nov. 2023

Undergraduate Research Assistant, advised by Prof. Jianfeng Mao *CUHK-Shenzhen*
- This work had published in *Information Fusion* [1]
- Developed a GNN framework integrating dynamic and adaptive graph learning with coupled attention mechanisms to address complex spatial-temporal dependencies in airport delay propagation
- Implemented periodic feature extraction and multifaceted information fusion modules to enhance performance
- Achieved SOTA performance in airport network delay propagation prediction, with 0.043% reduction in long-term prediction RMSE compared to the previous SOTA model

Text-to-Video Generative Models   Sep. 2024 – Present
Undergraduate Research Assistant, advised by Prof. Benyou Wang   *SRIBD*
- Downloaded and constructed a comprehensive video caption dataset for pretraining
- Developed a pipeline to assess video caption hallucination, filtering out low-quality data
- Established a robust evaluation framework for measuring and scoring video hallucinations, improving the quality and reliability of video generation models

Neural ODE Network for Flight Delay Prediction   Feb. 2024 – Present
Undergraduate Research Assistant, advised by Prof. Jianfeng Mao   *CUHK-Shenzhen*
- Developed a continuous graph using Neural ODE to enhance the interpretability of the model by incorporating mathematical formulations
- Achieved faster training time and reduced model complexity compared to traditional models
- Built baseline models to validate the performance of Neural ODE in aviation-related tasks
- Addressed challenges such as irregular time sampling and missing data in the dataset

Epidemic Transmission Prediction in Airport Networks   Aug. 2023 – Present
Undergraduate Research Assistant, advised by Prof. Jianfeng Mao   *CUHK-Shenzhen*
- This work is currently ongoing [3], to be submitted to *Transportation Research Part B: Methodological*
- Improved the SIS epidemiological model to simulate airport epidemic transmission
- Enhanced the SIS model by converting network transmission parameters into time-varying functions using adaptive graph learning (AdapGL)
- Incorporated heterogeneity, dynamic, and negative recovery states into the SIS model and used adaptive graph learning to predict infection and recovery states
- Compared the improved SIS model with classical ODE methods, LSTM, and ASTGCN models, demonstrating the superior performance of adaptive graph learning (GAT+AdapGL) in predicting extended states at airports
- Conducted simulation experiments, including setting infection rates and transmission processes consistent with real-world scenarios, validating the theoretical guidance's accuracy

Early Predicting and Controlling Network Flow in SDN   Jan. 2023 – Mar. 2023
Research Assistant Internship, advised by Prof. Kai Lei   *PKU-Shenzhen*
- Developed a novel network flow prediction method using a modified Informer architecture for Software-Defined Networks (SDN) to enhance traffic management and resource allocation
- Designed and implemented a proactive congestion management strategy based on the predictions, significantly reducing network delays and improving overall network performance
- Conducted extensive practical experiments in a simulated SDN environment to validate the effectiveness and scalability of the proposed method, achieving a notable increase in prediction accuracy and response times

PROJECTS

Quant-GPT: Money is All You Need [link] | *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 [link] | *PyTorch, LangChain*   Jan. 2024 – Apr. 2024
- Developed an AI system to predict flight delays and recommend personalized travel insurance, enhancing customer satisfaction
- 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 [link] | *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*
- Intern at the AI Large Model Research Team
- Analyze a technology's trends, applications, and industry impact

Shenzhen Branch of China Telecom   Jan. 2024 – Apr. 2024
Part-time Internship   *Shenzhen, China*
- Time Series Analysis, Data Visualization
- GIS Data Analysis, Data Mining

Technical Skills

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