Yuzhe Yang | 阳雨哲

Email: yuzheyang@link.cuhk.edu.cn | Phone: +86 18310762536 | Homepage: tobyyang7.github.io

A 3rd-year CSE student with a keen interest in deep learning. Currently exploring GNN and LLM.

Education

School of Data Science | The Chinese University of Hong Kong, Shenzhen *Sep 2021 - May 2025*
B.Eng. in Computer Science and Engineering (**Artificial Intelligence Stream**)
Core Curriculums: Data Structure | Operating System | Computer Architecture | Machine Learning | Optimization | NLP

Skills

Deep Learning Tools: PyTorch | PyTorch Geometric | Transformers   **Languages:** English (Fluent) | Mandarin (Native)

Work Experiences

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

Publication

FAST-CA: Fusion-based Adaptive Spatio-Temporal Learning with Coupled Attention for Airport Network Delay Propagation Prediction, Information Fusion, 2024, 107:102326 [online] *Jun 2023 - Nov 2023*
Undergraduate Research Assistant, supervised by Prof. Jianfeng Mao SDS, CUHK(SZ)
- Developed the GNN framework, integrating dynamic and adaptive graph learning with coupled attention mechanisms to address complex spatio-temporal dependencies in airport delay propagation
- Implemented periodicity feature extraction and multifaceted information fusion modules to enhance predictive accuracy
- State-of-the-art model for airport network delay propagation prediction
- Spatio-temporal data analysis and visualization

Research Experiences

Integrative Mean-Field Epidemic Model and Adaptive Graph Learning for Network-Wide Delay Propagation Dynamics Prediction *(working paper, to be submitted to Transportation Research Part B: Methodological)* *Dec 2023 - Present*
Undergraduate Research Assistant, supervised by Prof. Jianfeng Mao SDS, CUHK(SZ)
- 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

Quant-GPT: Money is All You Need [online] *Feb 2024 - May 2024*
Undergraduate Research Assistant, supervised by Prof. Benyou Wang SDS, CUHK(SZ)
- Developed a multi-agent optimized for A-share market investment decisions
- Fine-tune LLM and integrate with sentiment analysis and real-world market data
- Utilized RAG and multi-agents to dynamically access and synthesize relevant financial news, improving the model's ability to forecast market trends and returns
- Achieved superior performance metrics compared to existing open-source LLMs, with higher annualized return, lower maximum drawdown, and a better Sharpe ratio
- Demonstrated the potential of LLMs in financial applications, providing a robust framework for integrating natural language understanding with quantitative investment strategies

Research on Integration of LLM and Spatio-Temporal Data *Jun 2024 - Present*
Summer Research, advised by Prof. Kaize Ding Remote, Northwestern University
- Integrated LLM with spatio-temporal data to enhance imputation
- Focused on aligning LLM capabilities with spatio-temporal datasets to improve model performance

Deep Learning Approach for Early Predicting and Controlling Network Flow in SDN *Jan 2024 - Apr 2024*
Research Internship, advised by Prof. Kai Lei ICNLAB, PKU(SZ)
- 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 Experiences

Travel Insurance Recommendation AI System [online]   *Jan 2024 - May 2024*
*Distinguish Course Project of **Advanced Artificial Intelligence and Business Applications***   SME, CUHK(SZ)
*Advised by **Prof. Yutong Guo***
- Predict flight delays and recommend personalized travel insurance, in order to improve customer satisfaction
- Fine-tuned the LLM using insurance corpus to improve domain-specific question-answering capabilities
- Utilized deep learning, LLM, and sentiment analysis for accurate delay predictions and customer sentiment assessment

Flight Information System [online]   *Mar 2024 - Apr 2024*
- Developed a relational database system to optimize airline operations, including passenger bookings and flight logistics
- Integrated LLM to enhance database architecture and query generation
- Delivered a functional database with a user-friendly web interface, replicating realistic airline management dynamics

Evaluation Model of Light Pollution by Multi-conditional AHP | MCM   *Feb 2023*
- GIS-data analysis, Mathematical modeling
- Analyzed the level of light pollution in the area by population data, regional income data, etc.
- Explored the multifaceted impacts of light pollution on the region
- GeoPandas, Folium

Game Theory Analysis of SEO Strategies: From Methods to Models   *Oct 2023 - Dec 2023*
- Researched and implemented various Search Engine Optimization (SEO) strategies to improve website ranking
- Developed and validated a new ranking algorithm incorporating keyword frequency, traffic, and linkage
- Applied game theory principles to SEO, including simulation of an α-random walk and analysis of Nash Equilibrium
- Proposed a multi-stage strategy to handle the dynamic nature of SEO

1st and Future - Player Contact Detection Competition | Kaggle   *Dec 2022 - Mar 2023*
- Employed advanced data preprocessing techniques to clean and integrate complex datasets, including video analysis and player tracking information, ensuring high-quality inputs for model training.
- Innovated in creating predictive features by analyzing player movements and interactions through statistical modeling and signal processing, enhancing model accuracy in detecting contacts.
- Utilized ensemble learning and fine-tuned deep learning models to achieve high precision in contact detection
- Bronze Medal

Open Problems - Multimodal Single-Cell Integration | Kaggle   *Feb 2022 - Apr 2022*
- Machine Learning, Data Analysis
- Predict how DNA, RNA & protein measurements co-vary in single cells
- Silver Medal

Happywhale - Whale and Dolphin Identification | Kaggle   *Aug 2022 - Nov 2022*
- Machine Learning, Data Analysis
- Identify whales and dolphins by unique characteristics
- Silver Medal

Machine Learning Project *(in class)*   *Feb 2023 – May 2023*
- Data Analysis, Data Visualization
- Python: numpy, pandas, matplotlib, sklearn, scipy, etc
- Implemented model: Linear Regression, SVM, Decision Tree, K-Means, PCA, etc.

CPU Circuit design *(in class)*   *Jul 2023*
- Verilog, RISC-V
- Implemented simple RISC-V instructions through circuit design and realized CPU pipelining

Activities & Service

MUSE College Student Assistant: Outstanding College Contribution Award   *Sep 2021 - Sep 2023*
MUSE College Basketball Team   *Sep 2021 - Sep 2023*
P.I.C. Photography Club   *Sep 2021 - Jun 2022*
Personal Photography Gallery [online]