Lutao Yan

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Education

South China University of Technology **Sep. 2021 – Now**
Bachelor of Science in Data Science and Big Data Technology (Gifted Class,GPA:3.6/4.00) *Guangdong, China*

Research Interest

Multi-modal Learning, Information Retrieval, MLLM, LLM, Data Management, Visualization

Publication

ChartInsights: Evaluating Multimodal Large Language Models for Low-Level Chart Question Answering

- Author: Yifan Wu*, **Lutao Yan***, Leixian Shen, Yunhai Wang, Nan Tang, Yuyu Luo (* Equal Contribution)
- Conference: **EMNLP 2024**: Empirical Methods in Natural Language Processing
- Main Contribution: Curate the first benchmark focus on low-level data analysis tasks on charts. A large-scale dataset with 89,388 quartets (chart, task, question, answer). Propose a novel textual prompt strategy, named Chain-of-Charts, which boosts model performance by 24.36%.
- Preprint Link: Paper

Boosting Text-to-Chart Retrieval with Semantic Insights

- Author: Yifan Wu, **Lutao Yan**, et al, Nan Tang, Yuyu Luo (* Equal Contribution)
- Conference: **SIGIR 2025** *under review*
- Main Contribution: Develop an automatic pipeline for generating semantic insights from chart metadata. With these insight, we propose a new text-to-chart retrieval model that combines contrastive learning with the CLIP architecture. We also a first benchmark for text-to-chart retrieval sourced from real-world BI scenarios.
- Preprint Link: Paper

ChartCards: A Chart-Metadata Generation Framework for Multi-Task Chart Understanding

- Author: Yifan Wu*, **Lutao Yan***,et al, Nan Tang, Yuyu Luo (* Equal Contribution)
- Conference: **KDD 2025** *under review*
- Main Contribution: Addressing the limitations of existing text-chart retrieval methods, we propose the Chart-Finder model based on contrastive learning, achieving more accurate cross-modal alignment during training. Additionally, we construct CRBench, the first benchmark for text-chart retrieval in real-world BI scenarios.
- Preprint Link: Paper

ChartAlign: Instance-Level Visual Alignment for Robust Chart Understanding in MLLMs

- Author: Jing Xu, **Lutao Yan**, Zhihao Shuai, Weikai Yang
- Conference: **Neurips 2025** *under review*
- Main Contribution: We introduce the ChartPairs dataset, which supports instance-level alignment across diverse charts, and propose ChartAlign, an innovative instance-level alignment strategy designed to enhance the visual content understanding capability of image encoders for charts.
- Preprint Link: Paper

Academic Experience

Hong Kong University of Science and Technology (Guangzhou) **Jan. 2024 – Present**
Reaserch Intern *HKUST, guangzhou*

- Mentor: Yuyu Luo (DSA Thrust)
- Focus on visual analysis based on multimodal large language model (MLLM). Proposed a benchmark and data prompt for MLLMs
- Investigate how visual modifications to charts, such as altering visual elements and introducing perturbations, affect MLLM's performance.

The Chinese University of Hong Kong, Shenzhen **Jul. 2024 – Aug 2024**
Undergraduate Research Programme (UGSC) *School of Science and Engineering*

- Mentor: Fangxin Wang
- Focus on research about LLM and edge intelligence computing. Optimization of sparse models (MoE) for federated learning scenarios.

South China University of Technology **April 2023 – May 2024**
Research Assistant *Future Technology Department*

- Mentor: Ye Liu, Jin Xu
- Investigate cross-domain recognition techniques for lie detection. Conduct significance test using t-test and try to analyze eye movement and facial expression across multiple datasets.
- Develop a deception detection multimodal feature extraction and significance test tool.
- Implement big data analytics based on health data.

Internship

Thin Red Line Company | *Algorithm Lab Internship* **Jul. 2024 – Aug. 2024**

- Responsible for the design and development of the large language model evaluation system, assessment set design and development, and the output of the assessment technology report.
- According to the annotation rules, the text of various types of Al to carry out annotation work. Review the results of large model data annotation to ensure data quality.

National University of Singapore (NUS) | *Visiting Student* **July 2023**

- As an invited student to summer school in NUS, advised by Prabhu Natarajan, I improved image quality by implement advanced computer vision applications to recognize traffic signs.
- Enhance visual model performance with 98% accuracy by fine-tuning and get Distinction Grade(1%) at last assessment.

Honors and Awards

Future Technology Study Tour Prize **CNY 5000 Scholarship**
Second Prize *2024*

Future Technology Taihu Innovation Prize **CNY 5000 Scholarship**
Second Prize *2023*

National Contemporary Undergraduate Mathematical Contest in Modeling(CUMCM) **National competition**
Third Prize *2022*

Mathematical Contest in Modeling(MCM) **International competition**
Successful Participant *2022*

Thrice-Good Student of the Year **University-level Award**
Top 10% *2022*

Baidu "Paddle Paddle" Cup **Enterprise competition**
Excellence Award *2021*

Core Courses

Bachelor Courses:

Mathematics: Calculus II (4.0/4.0), Discrete Mathematics (4.0/4.0), Complex Variable(3.7/4.0) etc.

CS/CE: Advanced Language Programming (4.0/4.0), Introduction to Bid Data (4.0/4.0), Data Structure (3.7/4.0), Introduction to Engineering (4.0/4.0), Computer Network (4.0/4.0), Artificial Intelligence and 3D Vision (4.0/4.0), Introduction to Computer and Software Engineering (4.0/4.0), LLM and AI Engineering Design (3.7/4.0), Big Data Applications (4.0/4.0) etc.

Others: Engineering Drawing (4.0/4.0), General Physics III (3.7/4.0),Technical Commucation (4.0/4.0) etc.

Overseas Courses:

Carnegie Mellon University: A Window to Data Science in Technology Online Project-Based Learning Program (A Grade)

Cambridge Girton College: Artificial intelligence and applications in cybersecurity, software and security engineering Spring Programme (Upper Second Class)

Technical Skills

Languages: Python, Java, C, C++, SQL, Matlab
Developer Tools: VS Code, Eclipse, Google Cloud Platform, PyCharm,Visual Studio
Technologies/Frameworks: Linux, Pytorch,GitHub, MySQL, Latex, Tableau

Miscellaneous

Hobby: Skateboarding (Member of School Club), Track and Field (School-wide Silver Medal Winner)
Personal Homepage: More details and interesting life shared at Link