

# LUTAO YAN

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## Education

### South China University of Technology

*Bachelor of Science in Data Science and Big Data Technology*

Sep. 2021 – Now

*Guangdong, China*

## Research Interest

Multi-modal Learning, 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 *under review*
- 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](#)

## Academic Experience

### Hong Kong University of Science and Technology (Guangzhou)

Jan. 2024 – Present

*Research 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 AI 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

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<b>Future Technology Study Tour Prize</b> <i>Second Prize</i>	<b>CNY 5000 Scholarship</b> <i>2024</i>
<b>Future Technology Taihu Innovation Prize</b> <i>Second Prize</i>	<b>CNY 5000 Scholarship</b> <i>2023</i>
<b>National Contemporary Undergraduate Mathematical Contest in Modeling(CUMCM)</b> <i>Third Prize</i>	<b>National competition</b> <i>2022</i>
<b>Mathematical Contest in Modeling(MCM)</b> <i>Successful Participant</i>	<b>International competition</b> <i>2022</i>
<b>Thrice-Good Student of the Year</b> <i>Top 10%</i>	<b>University-level Award</b> <i>2022</i>
<b>Baidu “Paddle Paddle” Cup</b> <i>Excellence Award</i>	<b>Enterprise competition</b> <i>2021</i>

## Core Courses

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### 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

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**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

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**Hobby:** Skateboarding (Member of School Club), Track and Field (School-wide Silver Medal Winner)

**Personal Homepage:** More details and interesting life shared at [Link](#)