Tianxu Jiang

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Education

Emory University — Atlanta, U.S.
Research Intern — *May 2024 - Present*
Advisor: *Prof. Liang Zhao*
Theme: *Multimodal Models, Explainable AI, Medical AI*

University of Michigan — Ann Arbor, U.S.
M.S. Data Science — *Aug. 2023 - Present*
GPA: *4.0 / 4.0*
Courses: *Large Language Models, Information Retrieval, Machine Learning*

Fudan University — Shanghai, China
B.S. Statistics — *Sep. 2019 - June 2023*
Courses: *Data Structures and Introduction to Algorithms, Data Mining, Natural Language Processing*
Honor Program: *AI + X Micro-major Honor Program*

Papers Submitted

Multimodal Explanation-Guided Learning — In Preparation
Yifei Zhang, ***Tianxu Jiang*** *(Equal Contribution), Xiaofeng Yang, Liang Zhao*

Unified Uncertain Dual-prompts cross-domain Segmentation framework for medical image segmentation — Submitted
Ziyuan Qin, Lihan Wang, Yuting Shao, ***Tianxu Jiang****, Qikui Zhu*

Projects

Multimodal Explanation-Guided Learning — *May. 2024 - Sep. 2024*

- **MEGL Paradigm**: Proposed framework integrating supervision on both textual and visual explanations for more comprehensive and explainable AI reasoning
- **Multimodal Explanations**: Enhance the models' understanding of all aspects with multimodal explanations, including saliency maps and textual explanations
- **Consistency**: Further improved calculation of loss to overcome challenge of missing visual explanation modalities with multimodal consistency method

Self-Learning and Teacher-Guided Paradigms in Language Model Alignment — *Feb. 2024 - May 2024*

- **Paradigm Exploration**: Explored fine-tuning frameworks to enhance performance of language models through self-learning and teacher-guiding
- **Learning Architecture**: Constructed self-reward preferences pairs to establish a self-learning architecture and utilized assessment of a larger model (Gemini 1.5 Pro) to establish a teacher-guided paradigm
- **Boosted AlpacaEval Performance**: Fine-tuned a 2.7B model (Phi-2) with proposed paradigms and achieved improvement in head-to-head evaluation and AlpacaEval 2.0 (19% progress on the pre-trained model), surpassing Falcon 13B and approaching Alpaca 7B and Davinci001

LLaVA-Recipe: Visual Instruction Tuning Enhanced Food Recipe VQA — *Feb. 2024 - May 2024*

- **Culinary Assistant**: Augmented the capabilities of Large Language and Vision Assistant (LLaVA) for generating detailed cooking recipe from visual inputs
- **End-to-end fine-tuning**: Constructed a million level multi-turn dialogue dataset based on Recipe1M+ and conducted end-to-end fine-tuning with visual encoder weights frozen
- **Enhanced Performance in GPT Evaluation**: Performed knowledge injection to GPT 3.5 for better evaluation at a lower cost and enhanced the performance of model by up to 27% compared to baseline model

Internship Experience

Shanghai Consumer Big Data Lab (Fudan University) — Shanghai, China
Research Intern — *Mar. 2022 - Jul. 2022*

- **Prediction Framework**: Designed and implemented an LSTM-based framework , which effectively forecasted retail sales trend and reduced MAPE by 15% compared to the previous model
- **Evaluation Methodology**: Utilized Difference in Differences(DID) methodology to assess and quantify the impact of the "May 5th Shopping Festival" on consumer spending patterns and sales trend in Shanghai

China Pacific Insurance Group — Shanghai, China
Algorithm Engineer Intern — *Jun. 2021 - Aug. 2021*

- **HRNet-Based Project**: Developed a project based on High-Resolution Net (HRNet) for facial analysis
- **Facial Attributes Detection**: Implemented HRNet-based facial expression recognition (e.g. smiles) and facial attributes detection (e.g. dark circles) from key facial coordinates, achieving an accuracy of 87.4%
- **Facial position estimation**: Established HRNet-based **facial position estimation** (e.g. facial tilts and frontal-profile status) from key facial coordinates, achieving an accuracy of 92.3%

Skills

Languages: Python, C, SQL, R

Frameworks: AWS, Google Cloud, Multiprocessing, PyTorch, Transformers, Deepspeed, XGBoost, LightGBM