Tianjian Liu

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Education

Sun Yat-sen University, School of Computer Science and Engineering Sep. 2021 – Jun. 2025 (*exp.*)

- BS in National Informational Management
- GPA: 3.6/4.0, 86/100
- **Coursework:** Linear Algebra (91), Introduction of Natrual Language Processing (96), Artificial Neural Network (96), Pattern Recognition (92), Parallel Programming and Algorithms (90), Information Security (92).
- **Research Interests:** Dialogue System, Human-AI Interaction, Personalized Language Agent, Social Computing.

Publications

[UIST'24] Tianjian Liu, Hongzheng Zhao, Yuheng Liu, Xingbo Wang, Zhenhui Peng, "ComPeer: A Generative Conversational Agent for Proactive Peer Support."
The 37th Annual ACM Symposium on User Interface Software and Technology, ***Status: Conditional Accept (146/608)***

[ICWSM'24] Shuailin Li, Shiwei Wu, **Tianjian Liu**, Han Zhang, Qingyu Guo, Zhenhui Peng, "Understanding the Features of Text-Image Posts and Their Received Social Support in Online Grief Support Communities."
Proceedings of the Eighteenth International AAAI Conference on Web and Social Media, ***Status: Accept (15/129)***

Academic Awards

The second-grade scholarship (10%), Sun Yat-sen University, 2023

Academic Experience

A Proactive Conversational Agent for Peer Support Nov. 2023 - Aug. 2024
Sun Yat-sen University, HCI Research Group *Supervisor: Zhenhui Peng*

Conditional Accepted in UIST'2024 (CCF-A)

The research aims to develop a proactive conversational agent (CA) that can act as the peer supporter to plan, reflect, and offer proactive peer support, based on the learned information from the user.

- Implemented novel modules for adaptive proactive care, which can extract user information from conversations, and infer proper timing and content to proactive initiate chats. The proactive CA is **significantly better than the user-initiated baseline** (GPT-4 with Memory Module) in providing social support and maintaining user engagement.
- Employed **Chain-of-Thought, In-context Learning, and Retrieval-Augmented Generation** to enhance CA's planning and reasoning capabilities. Developed a **Character-based Role-Playing and Multi-LLMs Framework** to balance helpfulness and interest of the CA's responses, improving long-term attraction with users.
- Conducted a two-week study with 24 participants to evaluate the CA's performance in role-playing, social support, relationship progression, and user interaction.
- Applied qualitative and quantitative methods, demonstrating the CA's strengths in **social support and user engagement**. Identified **user preferences for proactive messages** and summarized **design principles for proactive CA**.
- Wrote an academic paper as the **first author**, which has been conditional accepted at the **UIST'24 conference (CCF-A)**.

Social Media Analysis in Online Grief Support Communities Jun. 2023 - Nov. 2023
Sun Yat-sen University, HCI Research Group *Supervisor: Zhenhui Peng*

Accepted in ICWSM'2024 (CCF-B)

The research aims to analyze the multimodal features of online posts, uncovering the impact of various features on

obtaining diverse social support.

- Collected data by reptile from Chinese and English Online Grief Support Communities and annotated a subset of the data by thematic analysis. Applied machine learning algorithms (*e.g.,* **Random Forest, Xgboost, SVM**) to build classifiers to predict the amount of social support in each post.
- Employed topic modeling algorithms such as **LDA and GSDMM** to analyze contents of posts, and finetuned pre-trained models including **structBert, Densenet, and VGG-19** for extracting features of posts with both text and images. Utilized regression models to analyze the correlation between multimodal features and social support.
- Engaged an academic paper as the third author, which has been accepted at the **ICWSM'24 conference (CCF-B)**.

Exploration in Model Fusion of Large Language Models May. 2024 - Present
Sun Yat-sen University, Laboratory for Intelligent Language Technologies *Supervisor: Xiaojun Quan*

The research aims to combine the capabilities of existing LLMs and transfer them into a single LLM. By learning the generative distributions of different source LLMs, the targeted LLM can acquire different strengths and knowledge of each source LLM.

- Explored the optimization of tokenizer alignment in the Model Fusion, employing similarity ratios instead of minimum edit distance as alignment metrics to enhance the precision of alignment.
- Explored the downstream application of Model Fusion.

Selected Projects

Chinese Sentence Corrector Jun. 2023 - Aug. 2023
Tools Used: Pytorch, transformers.

- Developed a Chinese error correction system based on pretrained models, fine-tuning Bert and GECToR to identify and correct spelling, grammar, and semantic errors in Chinese texts.
- Achieved an accuracy of 39.52% on CTC2021-Datasets, surpassing the performance of the 9th competitor.
- Employed P-tuning to finetune ChatGLM2-6B, refining the performance in Chinese text correction. Achieved an accuracy of 19.58% on CTC2021-Datasets with int-4 quantization.

Chatbot for Role-Playing Jan. 2024 - Feb. 2024
Tools Used: ChatHaruhi, Firefly, Langchain.

- Collected dialogue data from specific characters and finetuned the Yi-6b-chat and qwen1.5-7b-chat models by Lora and QLora to bulid role-playing LLMs.
- Developed a character dataset for ChatHaruhi, enhanced LLMs' role-playing capabilities by ChatHaruhi, and implemented a memory system using Langchain.

Languages & Technologies

Language Proficiency: Chinese - native, English - fluent (IELTS: 6.5).

Programming Languages: C, C++, Python, SQL, CUDA

Framework: Pytorch, Transformers, Langchain, Firefly, Gradio.

Developer Tools: SPSS, Visual Studio Code, GitHub, Huggingface, Modelscope.