Tianyang Liu

University of California, San Diego, La Jolla, CA, USA (858) 531-7715 til040@ucsd.edu
Personal Profile GitHub LinkedIn Google Scholar Twitter

Education

University of California, San Diego — **San Diego, CA, USA**
Ph.D. in Computer Science — 2024–Present
Mentor: Julian McAuley

University of California, San Diego — **San Diego, CA, USA**
M.Sc. in Computer Science — 2022–2024
Mentors: Zhiting Hu, Julian McAuley — GPA: 4.00/4.00

Wuhan University — **Wuhan, Hubei, China**
B.Eng. in Software Engineering — 2018–2022
Mentors: Peng Liang, Chong Wang — GPA: 3.85/4.00

Work Experience

NVIDIA — **Santa Clara, CA, USA**
Summer Intern — April 2024–Sep 2024

- Developed *compute-eval*, a benchmark tool for evaluating CUDA code generation capabilities of LLMs
- Created a general-purpose AI coding agent capable of assisting with software development tasks
- Enhanced the agent to interface with CUDA profiler tools (e.g., Nsight Systems and Nsight Compute), enabling AI-driven optimization of CUDA code performance

Mentor: Gaoyan Xie

Research Interests

My research spans **AI**, **ML**, and **NLP**, with a primary focus on advancing **Large Language Models (LLMs)**. I am dedicated to exploring their full potential, enhancing their reasoning and coding capabilities, and fostering their application across various sectors. Key areas include:

- **Understanding LLM Capabilities and Boundaries:** Conducting in-depth analysis of LLMs to evaluate their strengths, limitations, and ethical considerations, ensuring their effectiveness and responsible use in various contexts.
- **Augmenting LLMs with Symbolic and World-Aware Reasoning:** Integrating symbolic reasoning with LLMs, and enhancing their ability to interact with and interpret multimodal data, aiming to create more comprehensive and world-aware models.
- **Advancing Code Generation Capabilities:** Improving LLMs' ability to generate not only executable and high-quality code but also highly efficient code across various programming languages and complex situations.
- **Designing Intelligent LLM-Based Agents:** Creating versatile and autonomous agents powered by LLMs, capable of complex decision-making, task planning, and execution across diverse domains and applications.

Publications (* equal contribution)

2025

[1] **Imitate Before Detect: Aligning Machine Stylistic Preference for Machine-Revised Text Detection**
Jiaqi Chen*, Xiaoye Zhu*, **Tianyang Liu***, Ying Chen, Xinhui Chen, Yiwen Yuan, Chak Tou Leong, Zuchao Li, Long Tang, Lei Zhang, Chenyu Yan, Guanghao Mei, Jie Zhang, Lefei Zhang
AAAI 2025 [arXiv] [project] [code] [demo]

2024

[2] **Decentralized Arena via Collective LLM Intelligence: Building Automated, Robust, and Transparent LLM Evaluation for Numerous Dimensions**
Yanbin Yin, Zhen Wang, Kun Zhou, Xiangdong Zhang, Shibo Hao, Yi Gu, Jieyuan Liu, Somanshu Singla, **Tianyang Liu**, Eric P. Xing, Zhengzhong Liu, Haojian Jin, Zhiting Hu
Pre-release 2024 [blog] [leaderboard]

[3] **Dynamic Rewarding with Prompt Optimization Enables Tuning-free Self-Alignment of Language Models**
Somanshu Singla*, Zhen Wang*, **Tianyang Liu**, Abdullah Ashfaq, Zhiting Hu, Eric P. Xing
EMNLP 2024 [arXiv] [code]

[4] **LLM Reasoners: New Evaluation, Library, and Analysis of Step-by-Step Reasoning with Large Language Models**
Shibo Hao*, Yi Gu*, Haotian Luo*, **Tianyang Liu**, Xiyan Shao, Xinyuan Wang, Shuhua Xie, Haodi Ma, Adithya Samavedhi, Qiyue Gao, Zhen Wang, Zhiting Hu
COLM 2024 & ICLR 2024 Workshop on LLM Agents [arXiv] [blog] [Github]

[5] **StarCoder 2 and The Stack v2: The Next Generation**
Anton Lozhkov, Raymond Li, Loubna Ben Allal, Federico Cassano, Joel Lamy-Poirier, Nouamane Tazi, Ao Tang, Dmytro Pykhtar, Jiawei Liu, Yuxiang Wei, **Tianyang Liu**, Max Tian, and 54 more authors
Preprint 2024 [arXiv] [blog] [models]

[6] **Rethinking Tabular Data Understanding with Large Language Models**
Tianyang Liu, Fei Wang, Muhao Chen
NAACL 2024 [arXiv] [code]

[7] **RepoBench: Benchmarking Repository-Level Code Auto-Completion Systems**
Tianyang Liu, Canwen Xu, Julian McAuley
ICLR 2024 [arXiv] [code] [OpenReview]

2023

[8] **ToolkenGPT: Augmenting Frozen Language Models with Massive Tools via Tool Embeddings**
Shibo Hao, **Tianyang Liu**, Zhen Wang, Zhiting Hu
NeurIPS 2023 (Oral) [arXiv] [code]
Best Paper Award at SoCal NLP 2023

[9] **Architecture Decisions in AI-based Systems Development: An Empirical Study**
Beiqi Zhang, **Tianyang Liu**, Peng Liang, Chong Wang, Mojtaba Shahin, Jiaxin Yu
SANER 2023

[10] **RoseMatcher: Identifying the Impact of User Reviews on App Updates**
Tianyang Liu, Chong Wang, Kun Huang, Peng Liang, Beiqi Zhang, Maya Daneva, Marten van Sinderen
Information and Software Technology 2023

2022

[11] **The Role of User Reviews in App Updates: A Preliminary Investigation on App Release Notes**
Chong Wang*, **Tianyang Liu***, Peng Liang, Maya Daneva, Marten van Sinderen
APSEC 2022

🤝 Professional Services

Invited Reviewer	NLPCC 2023 ACL ARR (Dec 2023, Feb 2024, April 2024, June 2024, Aug 2024, Oct 2024) NeurIPS 2024 ICLR 2024, 2025 ICML 2024 COLM 2024 AAAI 2025 AISTATS 2025
Invited Speaker	LlamaIndex Seminar on Tabular Data Understanding

🏆 Awards

- Honorable Mention for Excellence in Research (CSE Department Award), UCSD, 2024
- Best Paper Award, SoCal NLP Symposium, 2023
- Second Level Scholarship, Wuhan University, 2021

💻 Technical Skills

- **Programming Languages**: Python, JavaScript, HTML, CSS, SQL, Bash, LaTeX, Git, VSCode, Jupyter Notebook
- **Machine Learning & Deep Learning Libraries**: PyTorch, TensorFlow, Huggingface Transformers 🤗, DeepSpeed, scikit-learn, Keras
- **Languages**: Chinese (native), English (fluent)