

# Xiangyu Zhang

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## EDUCATION

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**Tsinghua University**  
B.S. in Computer Science and Technology

Enrolled: Sept. 2022 — Expected: Jun. 2026  
GPA 3.84 / 4.0

## EXPERIENCE

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**Research Assistant**  
*Institute for AI Industry Research, Tsinghua University*  
Contributions:

Jun. 2024 - Present  
Advised by **Prof. Weizhi Ma**

- Lead a project to explore knowledge-irrelevant domain text transferring for AI agents.
- Collected pairwise data and trained retrievers for hint transferring.

**Research Assistant**  
*Institute for AI Industry Research, Tsinghua University*  
Achievements:

Jun. 2024 - Oct. 2024  
Advised by **Prof. Xianyuan Zhan**

- Developed a flexible training method of reinforcement learning with task-sensing and network composition.

Contributions:

- Proposed the idea of orthogonal LoRA training in reinforcement learning settings.
- Completed the coding and ran the related experiments of OpenAI gym simulations.

**Chief Information Officer / Project Manager**  
*Yixin Technology Inc.*  
Achievements:

Mar. 2024 - Dec. 2024

- Developed an application with mental health care and AI chatbot service.

Contributions:

- Led an IT team of ten students from UC Berkeley, University of Michigan, Tsinghua University, and etc.
- Led and participated in the full-stack implementation of back-end, front-end, UI design, deployment, and testing.

**Research Assistant**  
*Tsinghua Laboratory of Brain and Intelligence*  
Target:

Oct. 2023 - Oct. 2024  
Advised by **Prof. Sen Song**

- Established a RetNet based model with specific biological constraints.

Contributions:

- Completed fitting and visualization of network neuron activity and fMRI signal of voxels.

**Research Assistant**  
*Tsinghua Pervasive Human Computer Interaction Lab*  
Achievements:

Aug. 2023 - Nov. 2023  
Advised by **Prof. Yuanchun Shi**

- Introduced a new paradigm in which an agent accomplishes unknown tasks in an unknown environment.
- Presented a ready-to-use VCI named AutoTask, where end users can automate any intent with a single command.

Contributions:

- Analysed the work of previous papers and built a baseline model for the research.
- Assisted in completing user experiments.

## PROJECTS

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**Enhancing Large Language Model's Coding Ability by Tree-Based Searching Methods**      Dec. 2024 - Jan. 2025

*Project Link:* [https://github.com/Painkillerzzz/code\\_contest](https://github.com/Painkillerzzz/code_contest)

- Investigated reinforcement learning techniques to enhance the code generation capabilities of large language models.
- Conducted experiments on a dataset comprising 76 advance programming problems and their respective test cases.
- Implemented and evaluated four approaches: Best-of-N (Vanilla), MCTS-Append, MCTS-Modify, and Tree of Thought (ToT).
- Achieved notable success with the ToT method on simpler problems, demonstrating higher pass rates and efficient use of computational budgets under full test case feedback.
- Identified challenges with tree-based methods and proposed potential refinements and prompt designs to improve robustness and applicability in real-world scenarios.

### **I-Heart: A Chatbot for Mental Health and Psychotherapy**

Mar. 2024 - Jul. 2024

*Project Link:* coming soon

- Developed a chatbot consists of fine-tuned LLMs and text-to-speech models.
- Provide clients with customized treatments, supported by professional conversation and styled tune.

### **The Dance of Fire and Ice: A Hardware Music Game**

May. 2024 - Jun. 2024

*Project Link:* <https://github.com/Painkillerzzz/digital-logic-design>

- Developed a music video game based on FPGA and hardware design language.

### **Generals: An AI Agent Competition Game**

Sept. 2023 - Jan. 2024

*Project Link:* <https://www.saiblo.net/game/35>

- Developed an agent competition game and deployed it on a platform where competitors can submit their agents to fight against each other.
- Completed animations and model action control, participated in writing and debugging UI logic.

### **What's News: A Convenient News App**

Aug. 2023 - Sept. 2023

*Project Link:* <https://github.com/Painkillerzzz/WhatsNews>

- Developed a convenient Android news application with user database and elegant front-end interface.

## **PUBLICATIONS**

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Lihang Pan, Bowen Wang, Chun Yu, Yuxuan Chen, **Xiangyu Zhang**, Yuanchun Shi, "AutoTask: Executing Arbitrary Voice Commands by Exploring and Learning from Mobile GUI", arXiv:2312.16062 [cs.HC]

## **HONORS AND AWARDS**

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|--|---------------------------|
| • <b>Social Practice Excellence Scholarship</b>  | Tsinghua University, 2023 |
| • <b>Literary and Art Excellence Scholarship</b> | Tsinghua University, 2023 |
| • <b>Exllence Entrance Scholarship</b>           | Tsinghua University, 2022 |

## **SKILLS**

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- **Language:** Python, C/C++, Java, Kotlin, C#, SystemVerilog
- **Tool:** Pytorch, HuggingFace, SpikingJelly, Unity3D