Weixian Xu

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Education

Shanghai Jiao Tong University *Sept. 2023 – June 2027 (Expected)*
B.S. in Computer Science, **Zhiyuan College (ACM Honors Class)**

GPA: **3.90**/4.3
Selected Courses: Large Language Models (**A+**), Compiler Design (**A+**), Computer Systems (**A+**), Comprehensive Programming Practice (**A+**), Advanced Compiler Design (**A+**).

Research Interests

Human intelligence keeps learning and growing, but AI's intelligence remains largely fixed after training. As AI capabilities advance, models face increasingly complex environments that offer greater potential for learning. My research therefore focuses on test-time learning, especially enabling AI to identify what matters in increasingly heterogeneous feedback. This supports AI in better drawing insights from experiments to advance itself, meeting diverse application requirements, and most importantly inferring users' needs to better help humans.

Research Experience

Stanford University — SALT Lab *June 2026 – Present*
Research Intern; Advisor: Prof. Diyi Yang.

Princeton University — AI^2 Lab *Dec. 2025 – June 2026*
Remote Research Intern; Advisor: Prof. Mengdi Wang.

Shanghai Jiao Tong University — GAIR Lab *June 2025 – June 2026*
Research Intern; Advisor: Prof. Pengfei Liu.

Publications and Preprints

1. **Sherpa: Teaching LLMs to Teach Adaptively.**
   Weixian Xu, Yanzhe Zhang, Zora Zhiruo Wang, Changyu Chen, Diyi Yang.
   Preprint. [PDF] [arXiv]
2. **EEVEE: Towards Test-time Prompt Learning in the Real World for Self-Improving Agents.**
   Weixian Xu, Shilong Liu, Mengdi Wang.
   Accepted at the 2nd Workshop on Lifelong Agents (LLA), COLM 2026. [PDF] [arXiv]
3. **ASI-Evolve: Towards AI-Driven Discovery Across the AI Research Stack.**
   Weixian Xu‡, Tiantian Mi*, Yixiu Liu*, Yang Nan*, Zhimeng Zhou*, Lyumanshan Ye, Lin Zhang, Yu Qiao, Pengfei Liu†. (‡Leading author, *Core contributors, †Corresponding author)
   Accepted at the Workshop on Language Models for Scientific Discovery (LM4Sci), COLM 2026. [PDF]
4. **Neural Architecture Discovery via Autonomous Evolution.**
   Weixian Xu*, Yixiu Liu*, Yang Nan*, Lyumanshan Ye, Xiangkun Hu, Zhen Qin, Pengfei Liu.
   (*Equal contribution)
   COLM 2026. [PDF] [arXiv]
5. **Multi-Agent Evolve: LLM Self-Improve through Co-Evolution.**
   Yixing Chen, Yiding Wang, Siqi Zhu, **Weixian Xu**, Haofei Yu, Tao Feng, Muhan Zhang, Mostofa Patwary, Jiaxuan You.
   EMNLP 2026. [PDF]
6. **Speed by Simplicity: A Single-Stream Architecture for Fast Audio-Video Generative Foundation Model.**
   GAIR & Sand.ai (contributing author: **Weixian Xu**; full author list in the paper).
   Preprint. [PDF] [arXiv]

7. **An AI System for Autonomous Algorithm Evolution in Drug Development.**
Zhimeng Zhou, Yang Nan, Minjie Mou, Yuntao Qian, Yixiu Liu, Zhengyu Zuo, Hao Yang, **Weixian Xu**, Bo Li, Wanghao Jiang, Yanlin Ren, Yang Liao, Yimeng Wang, Yinghong Li, Qingxia Yang, Zhiheng Xi, Tiantian Mi, Huaicheng Sun, Pengfei Liu, Feng Zhu.
Preprint. [PDF] [bioRxiv]

Selected Research Projects

Sherpa: Teaching LLMs to Teach Adaptively [Code]
Stanford University; Advisor: Prof. Diyi Yang

- Trained LLM teachers through multi-turn reinforcement learning to adaptively teach students.
- Designed student archetypes with distinct learning preferences, requiring the teacher to infer each student's needs from their feedback and adapt its instruction accordingly.
- Improved simulated student performance in tutoring evaluations and generalized to a held-out benchmark. A human study further showed that the trained teachers better aligned with human teachers' preferences.

EEVEE: Towards Test-time Prompt Learning in the Real World for Self-Improving Agents [Code]
Princeton University; Advisor: Prof. Mengdi Wang

- Used prompt learning to improve an LLM's task classification and task solving, enhancing test-time performance on heterogeneous tasks.
- Interleaved task-routing and task-solving prompt learning to capture commonalities across tasks and develop specialized prompts for each task group.
- Outperformed prior prompt-learning methods, including GEPA and ACE, on heterogeneous task streams while remaining competitive on single benchmarks at comparable cost.

ASI-Evolve: Towards AI-Driven Discovery Across the AI Research Stack ★ 800+ [Code]
Shanghai Jiao Tong University; Advisor: Prof. Pengfei Liu

- Led the development of an agentic framework for AI-for-AI research, extending autonomous discovery from architecture design to pretraining data curation and reinforcement learning algorithm design.
- Structured research as a learn–design–experiment–analyze cycle that draws on prior knowledge, implements and tests new designs, and distills experimental findings into experience for later iterations.
- Achieved gains across all three research domains, with further successes in mathematics and biomedicine through transfer of the framework and its discoveries.

Neural Architecture Discovery via Autonomous Evolution ★ 1.1k+ [Code]
Shanghai Jiao Tong University; Advisor: Prof. Pengfei Liu

- Developed ASI-Arch, an AI scientist that autonomously designs linear attention architectures end to end.
- Grounded architecture proposals in an extensive literature collection and iteratively refined designs using insights distilled from its own experiments.
- Discovered **105 architectures** outperforming the SOTA baseline Gated DeltaNet across **1,773 experiments**, offering insights like addressing linear attention limitations through specialized MoE paths.

Selected Course Projects

[AI] MVP: Multiple Models for Vision-based Game-Playing
Computer Vision

- Developed a fast–slow system for purely vision-based game playing, improving performance by combining deliberative planning with real-time control.
- Combined a VLM for long-term reasoning with a lightweight visual network for immediate actions, coordinated through structured visual memory and dynamic action fusion.
- Outperformed standalone strong VLM baselines in our Soul Knight game-playing evaluation.

[System] ACore – OS Kernel [Code]

Comprehensive OS Kernel with Rust

Implemented a comprehensive OS kernel in Rust, supporting memory management with virtual memory and page allocation, process scheduling, thread management, user/kernel space isolation, and a virtual file system supporting multiple filesystems.

[System] IMXC – Compiler [Code]

Compiler with Java

Implemented a compiler for Mx*, a C-like language, achieving performance comparable to Clang through optimizations including Mem2Reg and graph-coloring register allocation. Additional features include function inlining, SCCP, ADCE, local common subexpression elimination, and multi-file compilation with incremental builds.

[System] CPU – RISC-V Processor [Code]

Processor Core with Verilog

Implemented a RISC-V processor core in Verilog using Tomasulo's algorithm, supporting the RV32I instruction set and deployment on FPGA hardware.

Awards and Honors

Foresight-Sequoia Talent Development Fund *2025*

***Top 5** students in Zhiyuan College*

Zhiyuan Honors Scholarship *2024–2026*

*Academic Excellence Award (**Top 2%** in SJTU)*

Provincial Second Prize, Chinese Physics Olympiad (CPhO) *2022*

Zhejiang Province

Teaching & Service

Head Teaching Assistant *Spring 2025*

Data Structures (CS1951), Instructor: Prof. Yong Yu.

Teaching Assistant *Fall 2024, 2025*

Programming (CS1953), Instructor: Prof. Huiyu Weng.

Class Monitor, ACM Honors Class *Present*

Lead the ACM cohort, coordinating schedules and managing administrative tasks.

Skills

Programming	C++, Python, Java, Rust, Verilog
Tools	Git, Markdown, LaTeX, PyTorch, Linux
Languages	Chinese (Native), English (Fluent, TOEFL 5.5, Speaking 5)