

# Bohan Lyu

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## EDUCATION

**Tsinghua University** 2022 - 2026 (expected)  
*Dual Major: Computer Science and Technology & Economics and Finance* GPA: 3.83/4.00  
**University of California, San Diego** July 2024 - Sept. 2024  
*Research Intern at Department of CSE, advised by Prof. Rose Yu.*

## COURSE WORK

**Selected A Courses:** Data Mining (A+, Top 1), Artificial Intelligence, Computational Humanities and Social Sciences, Computer Graphics, Linear Algebra (Advanced), Discrete Mathematics, Econometrics, Intermediate Microeconomics, Object-Oriented Programming, Linear Algebra, Calculus A(2), etc.

## ACADEMIC WORK

Member of 'Sparking Program', the most prestigious and selective academic organization at Tsinghua Uni.  
**Reviewer** of ICLR 2025, LLMagents @ ICLR 2024, AI4MATH @ ICML 2024.  
**Academic Interests:** Natural Language Processing, AI for Science.

## PUBLICATIONS & PROJECTS (★ INDICATES EQUAL CONTRIBUTION)

**Adapting While Learning: Grounding LLMs for Scientific Problems with Intelligent Tool Usage Adaptation** | *First Author* | <https://arxiv.org/abs/2411.00412> Oct. 2024  
 Bohan Lyu★, Yadi Cao★, Duncan Watson-Parris, Leon Bergen, Taylor Berg-Kirkpatrick, Rose Yu

**AAAI Fall Symposium Series 2024 (Oral), Main Conference to be submitted**

Developed a fine-tuning framework for LLMs to internalize knowledge and balance reasoning with tool usage, achieving a 28.18% improvement in answer accuracy and a 13.89% increase in tool usage precision, surpassing state-of-the-art models.

**Enhancing LLM's Capabilities in Open Domains via Autonomous Tool Integration** | *First Author* | <http://lyubh.cn/pdfs/GitAgent.pdf> (An updated version) | <https://arxiv.org/abs/2312.17294> Dec. 2023

Bohan Lyu★, Xin Cong★, Heyang Yu, Pan Yang, Yujia Qin, Yining Ye, Yaxi Lu, Zhong Zhang, Yukun Yan, Yankai Lin, Zhiyuan Liu, Maosong Sun

Developed an autonomous agent that leverages GitHub repositories to extend its capabilities to address diverse user queries. Introduced a new agent architecture that achieved SOTA performance on SciAct.

**XAgent** | *Team member* | <https://github.com/OpenBMB/XAgent> Oct. 2023  
 7k-star project on Github. I am responsible for algorithm optimization and autonomous tool extension of the Agent.

## RESEARCH & INTERNSHIP EXPERIENCES

**Rose Spatiotemporal Lab, UCSD** | *Research Intern* July 2024 – Nov. 2024

- Hosted and advised by Prof. Rose Yu. Co-advised by Prof. Taylor Berg-Kirkpatrick, Prof. Leon Bergen and Prof. Duncan Watson-Parris. Worked with Dr. Yadi Cao.
- Worked on LLM Alignment, especially Physics-Guided LLM.

**Tsinghua University NLP Lab** | *Research Intern* July 2023 – Present

- Advised by Prof. Zhiyuan Liu. Worked with Dr. Yujia Qin.
- Led IDM and SciAct projects and contributed to XAgent team.
- Exploring how multimodal (GUI) agents can learn to act from tutorial videos with imitation learning.

**China Securities** | *Quantitative Research Intern* June 2023 – Sept. 2023

- Worked on Microsoft Qlib and optimized neural networks and algorithms including TCTS, TRA, HIST, etc.
- Independently studied and completed a survey on "Application of Diffusion Models in Temporal Data Analysis".

AWARDS & ACHIEVEMENTS

Baidu Inc. Data Mining Competition   No. 1/636	June 2024
National College Student Mathematical Modeling Contest   First Prize in Beijing	Oct. 2023
Tsinghua University’s Challenge Cup   Second Place, Newcomer Prize, Team Leader	Apr. 2024
Contest of Scientific Communication   Best Paper of Popularity, Independent contributor	May 2024
Mid-term Outstanding Project of the Academic Advancement Program	Nov. 2024
Digital Economy Research Project   Team Gold Prize	Nov. 2023
Tsinghua University’s Business Imitation Contest   Third Place, Team Leader	Oct. 2022

AWARDED RESEARCH GRANTS & SCHOLARSHIPS

Global Exploration Initiative   ¥30,000, Grade A, Independent Applicant	Apr. 2024
Academic Advancement Program   ¥20,000, Grade B, Applicant	May 2024
Technology Innovation Excellence Scholarship   ¥5,000, Independent Applicant	Oct. 2024
‘Sparking Program’   ¥5,000, Independent Applicant	May 2024
Student Research Training   ¥5,000, Independent Applicant	Mar. 2024
Tsinghua University’s Challenge Cup   ¥3,000	Mar. 2024

SKILLS

Languages: English, Chinese.
Computer Languages: C/C++, Python, System Verilog, LEAN4, MATLAB, L <sup>A</sup> T <sub>E</sub> X.
Tools: DeepSpeed, vllm, pytorch, Git, Shell, Vim, ssh, Docker, gdb & pdb, SQL, etc.

COMMUNITY INVOLVEMENT

Mentor at ‘Program Buddy’, assisting peers with data structures, algorithms, and programming challenges.
Grade Representative of the Tsinghua University High School Alumni Association.
Core member of Academic Department of Student Union, SEM, Tsinghua University.