

# Xinghan Li

✉ xh092113 ✉ xh-li22@mails.tsinghua.edu.cn ☎ +86 150 0016 2231 ⚙ Beijing, China

## Education

**Bachelor of Science in Computer Science (Artificial Intelligence Track)**

2022 - Present

*IIS (Yao Class), Tsinghua University*

- Selected Coursework: Deep Learning (4.0), Natural Language Processing (4.0), Economics and Computation (4.0), Algebra and Computation (4.0), Probability and Statistics (4.0), Artificial Intelligence: Principles and Techniques (4.0), Advanced Theoretic Computer Science (4.0, graduate course), Introduction to Optimization (4.0), Multi-modal Machine Learning (4.0), Brain Inspired Computing and Brain Inspired Computing System Technology (4.0)
- GPA: 3.85/4.00 (Ranking: 36/94)

## Research Experience

**Low-Cost Offline Strategies for Stimulating Mathematical Reasoning in Pre-Trained Language Models**

May 2025 - Present

*Research Intern, University of Washington, Seattle*

*Advisor: Simon Shaolei Du*

- Investigated low-cost, offline alternatives to RL for enhancing mathematical reasoning in LLMs, aiming to bridge the gap between expensive online methods and efficient SFT.
- Established strong performance baselines by systematically evaluating a suite of non-training, prompt-based techniques, achieving a score within 2.2% of the online RL target.
- Proposed and implemented novel offline training methods designed to mimic RL reward mechanisms within a static SFT framework.

**Adam Reduces a Unique Form of Sharpness: Theoretical Insights Near the Minimizer Manifold (NeurIPS 2025 Poster)**

July 2024 - May 2025

*Advisor: Kaifeng Lyu*

- Captured the long-term behavior of the Adam optimizer near the minimizer manifold using Stochastic Differential Equations (SDEs)
- Demonstrated that Adam implicitly minimizes a unique form of sharpness distinct from SGD and provided case studies analyzing the impact of this discrepancy
- Proved high-probability convergence analysis for Adam near the minimizer manifold

**Quantitative Research Intern**

August 2023

*Advisor: Jian Li*

- Developed and backtested various financial factors based on classic reversal and liquidity factors
- Invoked Optuna to tune factors based on machine learning methods which benefited outcome

## Course Projects

**‘Stubbornness’ of LLMs: Connecting Counterfactual Context Reliance and Knowledge Editing**

November 2024 - December 2024

*Natural Language Processing course project*

- Empirically demonstrated that the reliance of LLMs on counterfactual context align with the difficulty of performing knowledge editing on them, revealing an underlying ‘stubbornness’ property of LLMs.

- Analyzed the effect of knowledge popularity on finetuning, observing that models trained on less popular data exhibit a slower context-parametric inversion (CPI)

### Diffusion Models and Adversarial Robustness: A Comprehensive Survey

June 2024

*Advanced Theoretical Computer Science course project*

- Explored the use of diffusion models for adversarial robustness and categorized literature into: Denoised Smoothing, Robust Classifiers, and Adversarial Training with DM-generated data
- Highlighted a gap between theory and practice in adversarial robustness and emphasized the need for cross-inspiration between different research directions to effectively leverage diffusion models and enhance robustness

### Diffusion4Text

*Deep Learning course project*

April 2024 - June 2024

- Adopted the GENIE diffusion-for-text architecture, created a supervised code dataset which we fine-tuned on
- Witnessed a satisfying performance in the code description task and the diffusion process on an abstract semantic level

### The Past and Present of Brain-Inspired Computing Algorithms

*Brain-Inspired Computing and Brain-Inspired Computing System Technology course project*

January 2024

- Reviewed the characteristics of Spiking Neural Networks (SNNs), focusing on neuron models, neural coding and learning methods, and outlined an evolving research trajectory towards increasingly brain-like simulations.

## Extracurricular Experience

---

### Elected Class Monitor, Computer Science Class 22

September 2023 - September 2024

- Elected by classmates as the class monitor, demonstrating strong leadership and peer recognition
- Organized numerous external activities including a networking event with the Neurobiology Class of Peking University, and established a class database and the Class GPT Plus sharing program
- Led the class to win honors such as “First-Class Youth League Branch” and “Best Class Culture Branch”

### Member, Tsinghua University Symphonic Band

September 2022 - Present

- Trombone player, awarded as an outstanding member and received the Art Excellence Scholarship

## Honours and Awards

---

- Comprehensive Merit Scholarship of Tsinghua University (2024)
- Tsinghua Xuetang Talents Program Scholarship (2022, 2023, 2024)
- Second-class Freshman Scholarship of Tsinghua University (2022, 2023, 2024)
- Art Excellence Scholarship of Tsinghua University (2023, 2024)
- Asia-Pacific Informatics Olympiad, Gold Medal (2021)
- National Olympiad in Informatics, Silver Medal (2020, 2021)

## Skills

---

**Programming Languages:** C, C# & C++, Python, LaTeX, Triton, Java

**Languages:** Chinese (Native), English (TOEFL 108), Japanese (JLPT N2)

**Current Research Interests:** RL for Math Reasoning, Learning Dynamics of Optimizers

**Other Interested Areas:** Interpretability, Adversarial Robustness, Physics of LLMs

**Personal Interests:** Photography, Rail Transit Systems