Yibin (Leon) Liu

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Education

Northeastern University, Shenyang, China *Sept 2022 – June 2026*
Bachelor of Artificial Intelligence, College of Information Science and Engineering

- Achievements: 87.2/100 (Overall), 91.4/100 (Major)
- Programs: 985, 211, Double First Class University

Global Innovation Exchange - UW & Tsinghua *Jul 2024 – Oct 2024*
Access Computing Summer Program, AI & HCI
A collaboration between the University of Washington, Tsinghua University, and Microsoft, focused on AI and HCI innovation. Full scholarship awarded.

Selected Courses & GPA:
Fundamentals of Machine Learning (99), Digital Signal Processing (96), Computing Theory (95), Discrete Mathematics (91), Image Processing and Computer Vision (93), Modern Control Engineering (93), Intelligent Optimization Algorithm (90), Autonomous Unmanned Systems (93), Fundamentals of Programming C (93)

Research Interests

My research interests include:

- **Grounding language in spatial understanding and robotic manipulation**
- **Learning robotic poses and structures in specific task and workspace settings**

Research Experience

Research Assistant at Shanghai AI Lab & ScaleLab, SJTU *Mar 2025 – Present*
Advisor: A/Prof Yao (Mark) Mu, PhD Candidate Zhixuan Liang

- Robotic behavior code generation via reinforcement learning in close-loop physical simulation.
- Large-scale VLA (Vision-Language-Action) training data curation and quality assessment.

Research Assistant at Pervasive HCI Lab, Tsinghua University *Jun 2024 – Jan 2025*
Advisor: A/Prof Nan Gao, Chun Yu

- Conducted research in family education using LLM and HCI to infer behaviors and mental states, promoting self-awareness and well-being. our research represents a novel application of LLMs to encode and analyze human behavior through dialogue data directly, and develop a family education strategies recommendation System in real-world scenarios.

Research Assistant at NEUIR, Northeastern University *Oct 2023 – Apr 2024*
Advisor: A/Prof Zhenghao Liu

- Research on exploring RAG methods that address the knowledge needs of LLMs. Centered around the concept of augmentation, our research explores from a cognitive science perspective how to effectively leverage external knowledge and the parametric memory of LLM to enhance its capabilities.

Publications

The Homework Wars: Exploring Emotions, Behaviours, and Conflicts in Parent-Child Homework Interactions (Under major revision for ACM IMWUT/UbiComp 2025) Under major revision

Nan Gao, ***Yibin Liu***, Xin Tang, Yanyan Liu, Chun Yu, Yun Huang, Xuhai "Orson" Xu, Jun Wei, Yuanchun Shi

Self-Guide: A LLM Reasoning Enhancement Method Based on Self-Guided Planning. (Journal of Chinese Information Processing) 2024

Yibin Liu, Zhenghao Liu, Yukun Yan, Shi Yu, Shuo Wang, Liner Yang, Yu Gu, Ge Yu, Huimin Chen

Academic Activities

- **Academic Service:** Reviewer for Chinese CHI 2024
- **Talks:** 2024.08, "Retrieval-Augmented Generation Modeling" for Mingtong Weilai (Beijing) Digital Health Science & Technology Research Institute.

Awards

- 2024.11 Outstanding Individual in Technological Innovation of Northeastern University
- 2024.05 **Finalist** in Mathematical Contest in Modeling (MCM/ICM), **Top 2% of 10,387 teams**
- 2023.10 National Level Third Prize in **RoboCup** China Competition, Simulation 3D League
- 2023.10 National Level Second Prize in FIRA SimuroSot China Competition
- 2023.11 Future Technology Taihu Scholarship
- 2023.09 Excellent Student Scholarship at Northeastern University

Projects

MinRL: Minimal, Clean Code for Reinforcement Learning (69 Stars) *GitHub Repository*

- **Recognized and pinned by MathFoundationRL, the most popular RL course on Chinese platforms, under "Third-party code and materials".**
- Developed a comprehensive educational reinforcement learning framework featuring clean implementations of fundamental algorithms (Policy Evaluation, Monte Carlo Methods, MCTS, Q-Learning, PPO) in a customizable GridWorld environment. Implemented visualization tools and maintained 100% test coverage for production-quality code.
- Tools Used: Python, PyTorch, pytest

Autoregressive Language Model *GitHub Repository*

- Developed a beginner-friendly autoregressive Transformer-based language model, covering all steps from data processing to model training, evaluation, and inference. Employed manual tokenization with regular expressions and Byte Pair Encoding, integrated with WandB for real-time experiment tracking.
- Tools Used: Python, PyTorch, WandB, Hugging Face

Bencao RAG Medical Intelligent Assistant *GitHub Repository*

- Developed a medical knowledge question-answering system that integrates context awareness, internet access, knowledge graphs, and RAG method to provide accurate and personalized medical information. Built a user-friendly interface with Streamlit for seamless interaction.
- Tools Used: Python, RAG, LLM, LangChain, Streamlit, Neo4j, Knowledge Graph

Lane Detection Pipeline *GitHub Repository*

- Developed a pipeline to detect lane lines on the road using computer vision techniques applied to video input. Outputs include annotated video frames with detected lanes, curvature, and vehicle offset information for autonomous driving systems.
- Tools Used: Python, OpenCV, NumPy

Technologies

Languages: Python, C++, C, HTML/CSS, JavaScript, SQL, MATLAB/Simulink, LaTeX

Technologies: PyTorch, Hugging Face, scikit-learn, ROS, OpenCV, NumPy, Git, RAG, Linux, SLAM