Beijie Liu

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https://keke-hub.com/portfolio/ | github.com/keke1022

Education

University of Southern California — Los Angeles, CA
Ph.D. in Computer Science — Sept 2025 - May 2030 (Expected)

- **Advisor**: Prof. Mengyuan Li
- **Research areas:** AI safety, ML systems, verification

University of Michigan — Ann Arbor, MI
B.S.E. in Computer Science — Aug 2023 - May 2025

- **Overall GPA:** 3.89/4.0, **Major GPA:** 3.89/4.0

Shanghai Jiao Tong University — Shanghai, China
B.E. in Electrical and Computer Engineering — Sept 2021 - Aug 2025

- **Overall GPA:** 3.74/4.0, **Major GPA:** 3.95/4.0, **Ranking**: top 20%

Research Interests

LLM security, LLM verification, trustworthy ML

Publications

WAVE: Leveraging Architecture Observation for Privacy-Preserving Model Oversight.
Haoxuan Xu, Chen Gong, Beijie Liu, Haizhong Zheng, Beidi Chen, Mengyuan Li.
ASPLOS, 2026.

Training with Confidence: Catching Silent Errors in Deep Learning Training with Automated Proactive Checks.
Yuxuan Jiang, Ziming Zhou, Boyu Xu, Beijie Liu, Runhui Xu, Peng Huang.
OSDI, 2025.

Manuscripts Under Review

Hollow-LLM Attack: Computationally Trivial Weights in Zero-Knowledge Verification of LLM Inference.
Chen Gong, Beijie Liu, Mengyuan Li.
Under Submission, 2026.

Research Experience

Research Assistant, OrderLab Research Group, University of Michigan — May 2024 - Dec 2024

Training with Confidence: Catching Silent DL Training Bugs with Automated Proactive Checks

- Designed a static analyzer to identify Python-side functions closely coupled with C/C++ backends in PyTorch, enabling high-coverage and low-overhead dynamic proxy instrumentation
- Built a dynamic tracing system to infer API signatures and data dependencies from PyTorch programs
- Proposed a novel “Var Preserve Invariant" pattern to catch silent type-related bugs in model training, identifying 3 real bugs including PyTorch issue #84803
- **Paper accepted by OSDI 2025**

Research Assistant, CHAI Lab Research Group, University of Michigan — May 2024 - Apr 2025

AI model for Speech Annotation

- Collaborated with PhD researchers and clinical partners as the sole undergraduate on a multi-disciplinary team.
- Developed a dual-path model: wav2vec2 for acoustic embeddings + ASR-BERT for semantic analysis.
- Integrated the model into a live annotation tool for clinicians (Excel-based pipeline).
- Presented results at two SURE showcase events.

Research Assistant, Acemap Research Group, Shanghai Jiao Tong University Feb 2022 – Aug 2022

Deep Learning for Geological Data Mining

- Designed preprocessing and augmentation pipelines for large-scale geoscience text datasets.
- Improved document retrieval performance using optimized MongoDB pipelines.
- Built graph-based knowledge visualizations using Gephi.

Technologies

Programming & ML Systems: Python, PyTorch, CUDA, C++, Rust, Tensor parallelism, quantization
Tools: Trusted Execution Environments, Nsight Compute, Git, Docker, GPU profiling
Frameworks: PyTorch, Hugging Face Transformers, FlashAttention

Teaching & Leadership

Teaching Assistant, EECS 445: Machine Learning, University of Michigan Fall 2024

- Led weekly discussion sections and office hours for 200+ students
- Helped grade assignments and design ML programming projects
- Mentored students on training stability, debugging, and evaluation

Vice President, Student Sci & Tech Innovation Association, SJTU Aug 2022 – Aug 2023

- Led a 20-member team organizing university-wide innovation showcases
- Managed project reviews and coordinated collaboration with faculty
- Organized technical workshops reaching 200+ undergraduates

Awards & Honors

Scholarships & Honors

Dean's List, University of Michigan Dec 2023 & Apr 2024
University Honors, University of Michigan Dec 2023 & May 2024
Yu Liming Scholarship (Top 1%), Shanghai Jiao Tong University Nov 2022

Academic Competitions

Honorable Mention, Mathematical Contest in Modeling (MCM) Feb 2023
Third Prize, National Student Mathematics Competition Apr 2022
Second Prize, Industrial Design Award, VEX Robotics Competition, JI Oct 2021

Relevant Coursework

Machine Learning: Machine Learning, Deep Learning, Probabilistic Modeling, Data Mining
Systems & Security: Operating Systems, Computer Architecture, Distributed Systems, Computer Security
Mathematics & Theory: Linear Algebra, Optimization, Discrete Math, Probability & Statistics