Jiaheng Lu

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Education

University of Michigan (U-M) — Ann Arbor, Michigan, USA
M.S.E. in Electrical and Computer Engineering — *Aug 2023 – May 2025 (Expected)*

- GPA: 3.94/4.0
- Related Courses: EECS 598 System for Generative AI (A+), EECS 501 Probability and Random Process (A)
- Advisors: Mosharaf Chowdhury, Ang Chen

Central South University (CSU) — Changsha, Hunan, China
B.E. in Computer Science and Technology — *Sep 2019 – Jun 2023*

- GPA: 90.13/100
- Related Courses: Distributed System and Cloud Computing (96), Information and Network Security (96)

Publications

1. **Jiaheng Lu***, Yiwen Zhang*, Hasan Al Maruf, Minseo Park, Yunxuan Tang, Fan Lai, Mosharaf Chowdhury, "Mercury: QoS-Aware Tiered Memory System", In submission to **OSDI**, 2025
   **Equal contribution*
2. **Jiaheng Lu**, Yunming Xiao, Shmeelok Chakraborty, Silvery Fu, Yoon Sung Ji, Ang Chen, Mosharaf Chowdhury, Nalini Rao, Sylvia Ratnasamy, Xinyu Wang, "OpenInfra: A Co-simulation Framework for the Infrastructure Nexus", **HotInfra (Co-located with SOSP)**, 2024
3. **Jiaheng Lu**, Zhenzhe Qu, Anfeng Liu, Shaobo Zhang, Neal N. Xiong, "MLM-WR: A Swarm-Intelligence-Based Cloud–Edge–Terminal Collaboration Data Collection Scheme in the Era of AIoT", **IEEE Internet of Things Journal**, 2023
4. **Jiaheng Lu**, Weirong Liu, "Automatic Information Extraction for Financial Events by Integrating BiGRU and Attention Mechanism", **Journal of Physics: Conference Series, International Conference on Computer, Big Data and Artificial Intelligence**, 2022

Research Experience

CXL-Enabled QoS-Aware Tiered Memory System — University of Michigan
Research Assistant, Advisor: Prof. Mosharaf Chowdhury — *Sep 2023 – Present*

- Conducted in-depth Quality-of-Service (QoS) analysis on Compute Express Link (CXL)-enabled memory systems, focusing on local memory contention and bandwidth interference
- Proposed a novel admission control mechanism with a real-time adaptation module tailored for tiered memory systems, enabling the achievement of different Service Level Objectives (SLOs) for coexisting applications
- Implemented a new kernel-level resource management scheme to control resources on tiered memory
- Paper submitted to OSDI 2025

Co-simulation Framework for the Infrastructure Nexus — University of Michigan
Research Assistant, Advisor: Prof. Ang Chen — *Feb 2024 – Present*

- Developed a framework to co-simulate the infrastructure nexus between data centers, water, and energy systems, deploying over 20 simulators
- Proposed a carbon-aware scheduling method for power and water usage
- Designed a novel Infrastructure-as-Code scheme for managing large-scale infrastructures, with simulations spanning 7,392 servers and 100+ hours
- Paper accepted at HotInfra 2024 (Co-located with SOSP); delivered a talk at the conference

Reliable Cloud-Edge-Terminal Data Collection Framework — Central South University
Research Assistant, Advisors: Profs. Anfeng Liu, Neal N. Xiong (Sul Ross State University) — *Feb 2022 – Jun 2023*

- Developed a reliable workers recognition method by evaluating workers' performance with the help of Unmanned Aerial Vehicles (UAVs)
- Designed algorithms to evaluate sensing reliability for various attributes and locations, using data error calculations with an original optimization framework

- Proposed a recruitment scheme based on swarm intelligence for Mobile Crowd Sensing, combining sensing reliability and recruitment cost
- Paper accepted at IEEE Internet of Things of Journal 2023

Cause-Effect Relationship Extraction from Text of Financial Events Central South University

Research Assistant, Advisor: Prof. Weirong Liu *Jun 2021 – Jan 2022*

- Designed a Named Entity Recognition model based on BiGRU and self-attention mechanism to extract cause-effect relationships from the text of financial events, achieving 78% accuracy
- Implemented data processing and experiments using Python and PyTorch
- Paper accepted at ICCBDAI 2022

Selected Projects

Efficient Serving of Large-scale Vector Search University of Michigan

EECS 598 System for Generative AI, Advisor: Prof. Mosharaf Chowdhury *Feb 2024 – May 2024*

- Developed a system for serving vector search across large datasets using sharded indexes
- Enhanced overall batch throughput through asynchronous index loading and dynamic index file management
- Evaluated the system across various percentages of out-of-distribution and under different memory budgets
- **Ongoing:** Explore the CXL shared memory pool for optimal placement of model weights, KV cache, and vectors

Awards

Rackham Conference Travel Grant Fellowship	University of Michigan, 2024
Outstanding Graduate Student Award	Central South University, 2023
3rd Prize (National Division) and 1st Prize (Hunan Province Division), The 7th China International College Students' "Internet+" Innovation and Entrepreneurship Competition	Ministry of Education of China, 2022
Outstanding Student Award (Top 10%)	Central South University, 2021
2nd Prize Scholarship (Top 6%)	Central South University, 2021
3rd Prize Scholarship (Top 16%)	Central South University, 2020
Outstanding Student Leader Award (Top 3%)	Central South University, 2020

Skills

Programming Languages: Python, C/C++, Java, SQL, JavaScript, HTML/CSS, LaTeX

Frameworks: Docker, Kubernetes, Git, PyTorch, TensorFlow, Pandas, NumPy, Matplotlib, Jupyter

Technical Expertise: CXL memory, Linux kernel, Data center energy, CUDA kernel, Internet of Things

Leadership

Member of Engineering Student Government, U-M 2023-Present

- Helped organize activities

Class Monitor, School of Computer Science, CSU 2020-2023

- Acted as a liaison between students and teachers, and organized monthly class activities

Captain of Debate Team, School of Computer Science, CSU 2020-2021

- Organized school debate tournaments, involving over 100 participants, presiding over each as a judge

Chair of Industry Partnerships Department, School of Computer Science, CSU 2020-2021

- Raised over $5000 in funds for the school's annual New Year's Eve party