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Ruiming Lu

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EDUCATION

Ph.D in Computer Science **Shanghai Jiao Tong University** **Sep 2020 – Jun 2025**

- Research Fields: Interested in analyzing the failure characteristics of massively-deployed storage devices (e.g., NVMe SSD), understanding novel failure modes (e.g., the fail-slow failure), and designing practical fault-tolerant systems.

Visiting Ph.D Student **University of Michigan** **Jun 2023 – Jun 2024**

- Visiting PhD student affiliated with the CSE Department, University of Michigan, Ann Arbor.
- Advisor: Professor Ryan Huang.
- Research Fields: Understanding and improving fail-slow tolerance in large distributed system softwares.

B.Eng **Shanghai Jiao Tong University** **Sep 2016 – Aug 2020**

- B.Eng in Electrical and Computer Engineering (E.C.E.), University of Michigan - Shanghai Jiao Tong University Joint Institute.
- Graduate with distinction: **Outstanding Graduate in Shanghai** (top 1%).
- Core Coursework: Honors Calculus; Circuits; Signals and Systems; Data Structures; Discrete Mathematics; Linear Algebra; Probabilistic Methods; Bayesian Analysis; Computer Architecture; Operating Systems; Computer Network.
- Thesis: Six-degree-of-freedom Fixed Magnetic Levitation Device.

EMPLOYMENT

Software Engineer **Tencent Technologies** **Aug 2025–**

PUBLICATIONS

Conference Paper

- [1] Here, There and Everywhere: The Past, the Present and the Future of Local Storage in Cloud. Leping Yang, Yanbo Zhou, Gong Zeng, Li Zhang, Saisai Zhang, Ruilin Wu, Chaoyang Sun, Shiyi Luo, Wenrui Li, Keqiang Niu, Xiaolu Zhang, Junping Wu, Jiayi Zhu, Jiesheng Wu, Mariusz Barczak, Wayne Gao, **Ruiming Lu**, Erci Xu, and Guangtao Xue. **USENIX FAST 2026. Best Paper Award.**
- [2] Scheduling Cloud Block Storage Proactively and Reactively with Omar. Xinqi Chen, Weidong Zhang, Zhongyu Wang, Erci Xu, Xiaolu Zhang, Dong Wu, Junping Wu, **Ruiming Lu**, Yaheng Song, Chaolei Hu, Lijun Ding, Guangtao Xue, Patrick PC Lee. **EuroSys 2026.**
- [3] An Empirical Study of Issues in Large Language Model Training Systems. Yanjie Gao, **Ruiming Lu**, Haoxiang Lin, Yueguo Chen. **FSE 2025.**
- [4] **Ruiming Lu**, Yunchi Lu, Yuxuan Jiang, Guangtao Xue, Peng Huang. One-Size-Fits-None: Understanding and Enhancing Slow Fault Tolerance in Modern Distributed Systems. *Just Accepted*. **USENIX NSDI '25.**
- [5] **Ruiming Lu**, Erci Xu, Yiming Zhang, Fengyi Zhu, Zhaosheng Zhu, Mengtian Wang, Zongpeng Zhu, Guangtao Xue, Jiwu Shu, Minglu Li, Jiesheng Wu. Perseus: A Fail-Slow Detection Framework for Cloud Storage Systems. *In Proceedings of the 21st USENIX Conference on File and Storage Technologies*, February 2023. **USENIX FAST '23. Best Paper Award. Invited to appear in USENIX ;login: and fast-tracked to ToS.**
- [6] **Ruiming Lu**, Erci Xu, Yiming Zhang, Zhaosheng Zhu, Mengtian Wang, Zongpeng Zhu, Guangtao Xue, Minglu Li, Jiesheng Wu. NVMe SSD Failures in the Field: the Fail-Stop and the Fail-Slow. *In Proceedings of the 2022 USENIX Annual Technical Conference*, July 2022. **USENIX ATC '22.**

- [7] Yanbo Zhou, Erci Xu, Li Zhang, Kapil Karkra, Mariusz Barczak, Wayne Gao, Wojciech Malikowski, Mateusz Kozłowski, Łukasz Łasek, **Ruiming Lu**, Feng Yang, Lilong Huang, Xiaolu Zhang, Wenrui Li, Jinhu Li, Keqiang Niu, Jiaji Zhu, Jiesheng Wu. CSAL: the Next-Gen Local Disks for the Cloud. *In Proceedings of the 19th European Conference on Computer Systems*, April 2024. **EuroSys '24**.

Journal & Magazine Articles

- [8] **Ruiming Lu**, Erci Xu, Yiming Zhang, Fengyi Zhu, Zhaosheng Zhu, Mengtian Wang, Zongpeng Zhu, Guangtao Xue, Jiwu Shu, Minglu Li, Jiesheng Wu. From Missteps to Milestones: A Journey to Practical Fail-Slow Detection. *ACM Transactions on Storage, Volume 19, Issue 4, 2023*. **ACM ToS**.
- [9] **Ruiming Lu**, Erci Xu, Yiming Zhang, Fengyi Zhu, Zhaosheng Zhu, Mengtian Wang, Zongpeng Zhu, Guangtao Xue, Jiwu Shu, Minglu Li, Jiesheng Wu. Detecting Fail-Slow Failures in Large-Scale Cloud Storage Systems. *USENIX ;login: Online, February 9, 2023*. **USENIX ;login:**.
- [10] Xinqi Chen, Erci Xu, Dengyao Mo, **Ruiming Lu**, Haonan Wu, Dian Ding, Guangtao Xue. MasterPlan: A Reinforcement Learning Based Scheduler for Archive Storage. *ACM Transactions on Architecture and Code Optimization, Volume 22, Issue 1, 2025*. **ACM TACO**.

RESEARCH EXPERIENCE

Research Intern **Microsoft Research Asia** **Aug 2024 – Nov 2024**

- **Project:** An Empirical Study of Issues in Large Language Model Training Systems
- **Supervisor:** Dr. Jilong Xue.
- **Work:** Comb through issue tickets of three mainstream LLM training systems: Microsoft DeepSpeed, Nvidia Megatron-LM, and Hugging Face Transformers. Understand the common symptoms, root causes and current testing and debugging practices.

Research Intern **Alibaba Cloud** **Aug 2021 – Jun 2023**

- **Project:** Intelligent Analytic Methods for Safe Deployment in Large-Scale Cloud Infrastructures.
- **Supervisor:** Dr. Erci Xu, Professor Yiming Zhang, and Professor Guangtao Xue.
- **Work:** Design and implementation of a general, accurate, and adaptive fail-slow detection framework for storage devices (deployed in Alibaba Cloud).

Research Intern **Alibaba Cloud** **Jan 2021 – Apr 2022**

- **Project:** NVMe SSD Failure Study.
- **Supervisor:** Dr. Erci Xu, Professor Yiming Zhang, and Professor Guangtao Xue.
- **Work:** Comb through telemetry data of NVMe SSD at Alibaba Cloud; compare NVMe SSD with SATA SSD on recent reliability changes; analyze and benchmark a novel failure type – fail-slow;

Research Assistant **WNAI Lab, UM-SJTU JI** **Sep 2018 – Sep 2019**

- **Project:** 3D Finger Tracking based on Acoustic Sensor Array.
- **Supervisor:** Professor Xudong Wang.
- **Work:** Establish an acoustic sensor array platform using Arduino; experiment on position tracking of moving objects using FPGA.

SCHOLARSHIPS & AWARDS

- **Yang Yuanqing PhD Fellowship**, Oct 2024,
- **Huatai Technology Scholarship**, Dec 2023,
- **Outstanding Paper Award Honorable Mention**, World Artificial Intelligence Conference, Jun 2023
- **USENIX FAST 2023 Best Paper Award**, Feb 2023.
- **USENIX FAST 2023 Student Travel Grant**, Jan 2023.
- **Outstanding Graduate in Shanghai**, Aug 2020.
- **Annual Excellence Scholarship**, Sep 2017.
- **Yu Liming Scholarship**, Jan 2018 and Jan 2020.
- **Dean's List**, Sep 2017.

- **Best Innovation Award**, the Design Expo of UM-SJTU JI, Aug 2017.

TEACHING

Teaching Assistant

UM-SJTU JI

Jun 2018 – Aug 2018

- Teaching assistant for VG100: Introduction to Engineering.
- Hold weekly recitation classes and office hour; organize lab sessions.

PROFESSIONAL SKILLS

- **Programming Languages:** Python; Java; Go; Julia; C++; C; R; Matlab.
- **English Qualifications:**
 - TOFEL: 106 (Reading: 28; Listening: 28; Speaking: 24, Writing: 26).
 - CET6: 637 (Reading: 229; Listening: 214; Writing and Translation: 194).