Sijie Lan

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RESEARCH AREAS

My research focuses on I/O stack optimization, including file systems (such as F2FS and Btrfs) and storage devices (ZNS and FDP). I also study operating systems and computer architecture to improve system efficiency and reliability. My goal is to develop reliable and efficient kernel-level storage systems that fully utilize underlying device architectures.

EDUCATION

The Pennsylvania State University Aug, 2021 – May, 2026
Ph.D. student in Computer Science and Engineering (advisor: Prof. Mahmut Kandemir) *University Park, USA*

Xiamen University Sept, 2018 – June, 2021
M.Eng. in Computer Technology (advisor: Prof. Suzhen Wu) *Xiamen, China*

Zhejiang Sci-Tech University Sept, 2013 – June, 2017
B.Eng. in Computer Science and Technology *Hangzhou, China*

RESEARCH EXPERIENCE

Optimization on Zoned Namespace SSDs. Sept, 2023 – Present
Research Assistant *Penn State, USA*

- **New I/O Interface Beyond Block Abstraction:** Improve I/O stack efficiency and CPU utilization by redesigning the storage interface beyond traditional block-based abstractions. [Under Review]
- **Mapping Strategies for Emerging ZNS Devices:** Design efficient logical-to-physical mapping mechanisms to improve space utilization and performance on zoned storage devices. [Under Review]
- **Garbage Collection Optimization:** Reduce request latency and minimize GC overhead through improved reclamation strategies.

Flash Memory Reliability Sept, 2019 – May, 2021
Research Assistant *Xiamen University, China*

- **BitFlip Scheme for NAND Flash:** Improve reliability and reduce read latency by mitigating bit-error probabilities. [MSST 2020]

PUBLICATIONS

[C1] Suzhen Wu, **Sijie Lan**, Jindong Zhou, Hong Jiang, Zhirong Shen. *BitFlip: A Bit-Flipping Scheme for Reducing Read Latency and Improving Reliability of Flash Memory.* MSST 2020.

[C2] Yingtian Zhang, Yan Kang, Ziyu Ying, Wanhang Lu, **Sijie Lan**, Huijuan Xu, Kiwan Maeng, Anand Sivasubramaniam, Mahmut T. Kandemir, and Chita R. Das. *Pirate: No Compromise Low-Bandwidth VR Streaming for Edge Devices.* ASPLOS 2025.

WORK EXPERIENCE

Software Engineer Intern May, 2025 – Aug, 2025
Meta *Bellevue, WA*

- Developed SSD-based cached system for objective store.
- Implemented data validation and consistency mechanisms.
- Analyzed system-level storage efficiency and data organization.

SPECIALIZED SKILLS

Research Areas: File Systems, Storage Systems, Operating Systems, Flash Memory.
Programming Languages: C++, C, Shell, Python
Operating Systems: Linux, Windows

TEACHING EXPERIENCE

Teaching Assistant CMPSC 132 (Python and Data Structures)
Penn State *Spring 2022*

Teaching Assistant CMPSC 473 (Operating Systems)
Penn State *Fall 2021*

Teaching Assistant C Programming Language
Xiamen University *Fall 2019*