Ziyang Jiao

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Personal website
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Education

- **Syracuse University, New York** *Aug 2020 – May 2025*
  Ph.D. in Computer & Information Science & Engineering (GPA: 3.8/4.0)
  - Dissertation: Towards the next generation of storage stack for NAND flash memory-based systems
  - Advisor: Dr. Bryan S. Kim

- **Washington University in St. Louis, Missouri** *Aug 2019 – Aug 2020*
  M.S. in Computer Science (GPA: 4.0/4.0)

Research Interests

Imbue minimal yet meaningful knowledge into various layers of the I/O stack, thereby enabling a more efficient, synergistic, and adaptive storage ecosystem.

1. File and storage systems: how to interact and manage storage components efficiently.
2. Solid state drives: how to optimize the tradeoffs between capacity, performance, and reliability.
3. Green computing and sustainability: how to improve resource utilization and design sustainable storage architectures.

Publications and Talks

1. **Ziyang Jiao**, Omkar Desai, Jaeho Kim, Jongmoo Choi, and Bryan S. Kim. "paRAID: A Sustainable Storage Architecture with Heterogeneous SSDs." *(Under review).*

2. Xiangqun Zhang, **Ziyang Jiao**, and Bryan S. Kim. "ByteZ: When ZNS Meets Byte Interface." *(Under review).*

3. Omkar Desai, **Ziyang Jiao**, Shuyi Pei, Janki Bhimani, and Bryan S. Kim. "Preparation Meets Opportunity: Enhancing Data Preprocessing for ML Training With Seneca." *In USENIX Conference on File and Storage Technologies, 2026 (To appear).*

4. Xiangqun Zhang, **Ziyang Jiao**, Farzana Rahman, and Bryan S. Kim. "Filling in the Missing Piece: Integrating Storage into CompOrg Courses." *In American Society for Engineering Education (ASEE) Annual Conference and Exposition, 2025.*

5. **Ziyang Jiao** and Bryan S. Kim. "Asymmetric RAID: Rethinking RAID for SSD Heterogeneity." *In ACM Workshop on Hot Topics in Storage and File Systems, 2024.*

6. **Ziyang Jiao**, Xiangqun Zhang, Hojin Shin, Jongmoo Choi, and Bryan S. Kim. "The Design and Implementation of a Capacity-Variant Storage System." *In USENIX Conference on File and Storage Technologies, 2024.*

7. **Ziyang Jiao**, Janki Bhimani, and Bryan S. Kim. "Wear Leveling in SSDs Considered Harmful." *In ACM Workshop on Hot Topics in Storage and File Systems, 2022 (Best Paper Award).*

8. **Ziyang Jiao** and Bryan S. Kim. "Generating Realistic Wear Distributions for SSDs." *In ACM Workshop on Hot Topics in Storage and File Systems, 2022.*

9. **Ziyang Jiao** and Bryan S. Kim. "The Fast-Forwardable SSD Aging Framework." *In USENIX Conference on File and Storage Technologies (WiP), 2022.*

Experience and Internship

•**Syracuse University** *May 2020 – Now*
Research Assistant Syracuse, NY
- Advisor: Prof. Bryan S. Kim
- **All-flash array and sustainable systems**: optimizing system performance and storage sustainability by exploiting device heterogeneity from a larger SSD pool.
- **Failure-resilient storage systems**: exploiting the tradeoffs among capacity, performance, and reliability (CPR) in SSDs for performance stability and aging-resilience.
- **ML for storage and storage for ML**: (1) imbuing intelligence to the storage systems so that they can self-learn, self-configure, and self-manage. (2) designing a data loading system that optimizes cache partitioning and data sampling for the data processing pipeline.
- **Next-generation storage stack with emerging devices**: exploring the design of a storage stack using emerging devices (e.g., Flexible Data Placement) instead of traditional block devices.

•**Syracuse University** *Aug 2024 – Aug 2025*
Teaching Assistant Syracuse, NY
- Advisor: Prof. Bryan S. Kim
- Course link: CIS 341 - Computer Organization & Programming Systems (Fall 24, 31 students)
  Topics: Digital logic, data types and their representations, instruction set architecture, assembly language, program construction, CPU potpourri, memory hierarchy, privilege and security, input-output subsystems.

- Advisor: Prof. Farzana Rahman
- Course link: CSE 341 - Computer Organization & Programming Systems (Spring 25, 91 students)
  Topics: Digital logic, data type and representation, instruction set architecture, assembly language, program construction, processors, memory hierarchy, traps and interrupts, privilege and security, I/O.

•**Washington University in St. Louis** *Jan 2020 – Aug 2020*
Teaching Assistant St. Louis, MO
- Advisor: Prof. Chien-Ju Ho
- Course link: CSE 417T - Introduction to Machine Learning
- Topics: Generalization in finite and infinite hypothesis spaces; Linear models; Nonlinear transformations of data; Overfitting; Modern supervised learning techniques.

Skills

Core: Storage Systems, ML for Storage and Storage for ML, RAID Systems, Flash-based storage, Operating Systems, Memory Systems
Languages: C, C++, Python, Javascript, HTML5, Node.js
File systems: in-place update FSs (ext4), log-structured FSs (f2fs), file system utilities (e2fsprogs, f2fs-tools)
Databases: Transactional & analytical databases based on SQL & NoSQL (MySQL, RocksDB, LevelDB, MongoDB)
Kernel & Profiling: kernel (BCC Tools, bpftrace), block I/O (blktrace, blkparse, btrecord, btreplay), performance (perf), iostat, NVMe
Virtualization platforms & Frameworks: QEMU, Docker, Kubernetes

Academic Services

Reviewer
- IEEE Transactions on Storage (TOS) 2025
- IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) 2025

Shadow Program Committee
- European Conference on Computer Systems (EuroSys) 2025

Artifact Evaluation Committee
- USENIX Conference on File and Storage Technologies (FAST) 2024

Honors and Awards

Syracuse University Doctoral Award 2025
ECS Research Day Honorable Award 2024
Best Paper Award, ACM Workshop on Hot Topics in Storage and File Systems (HotStorage) 2022
Syracuse University Ph.D. Fellowship 2020, 2022
Outstanding Graduates 2019
Distinguished Undergraduate Thesis 2019
National Scholarship 2016
Outstanding Student Scholarship 2015,2016,2017,2018