

Chenhao Ye

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Education

Ph.D. student in Computer Science , University of Wisconsin–Madison	Madison, WI, Sep 2020 – May 2026 (expected)
▪ Advisors: Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau	
▪ Research Interests: AI Infrastructure, Storage Systems, Distributed Systems, Databases	
M.S. in Computer Science , University of Wisconsin–Madison	Madison, WI, Sep 2020 – Aug 2025
▪ GPA: 4.00 / 4.00	
B.S. in Computer Science , University of Wisconsin–Madison	Madison, WI, Jan 2019 – Aug 2020
▪ GPA: 4.00 / 4.00, Graduated with Honors	
B.S. in Electrical and Computer Engineering , Shanghai Jiao Tong University	Shanghai, China, Sep 2016 – Dec 2018
▪ GPA: 3.73 / 4.00	remote, May 2021 – Dec 2021

Work Experience

ByteDance , Seed Training Infrastructure	<i>Student Researcher</i> · San Jose, CA, May 2025 – Dec 2025
▪ Proposed <i>Reference-Oriented Storage</i> (ROS), a GPU-native storage architecture built atop RDMA for LLM reinforcement learning (RL), enabling efficient peer-to-peer data sharing with optimal transfer topology and zero memory redundancy.	
▪ Designed <i>TensorHub</i> , a ROS-based system for fault-tolerant, load-balanced weight synchronization in large-scale RL training; its concise abstractions and declarative interfaces simplify synchronization logic with $\sim 30\times$ code reduction, while achieving $6.7\times$ lower GPU stall time on a 1024-GPU training task and $19\times$ lower GPU stall time on a cross-datacenter training task.	
Microsoft Research , Data Systems Group	<i>Research Intern</i> · Redmond, WA, May 2024 – Aug 2024
▪ Designed <i>MultiLog</i> , a novel replication protocol that enables concurrent write-ahead log (WAL) replay with linear scalability, eliminating the sequential bottleneck of traditional WAL replication while preserving consistency.	
▪ Implemented MultiLog on Garnet, a high-performance distributed KV cache-store; the system is now production-ready and will be open-sourced soon.	
Snowflake , Global Platform Team	<i>Software Engineer Intern</i> · San Mateo, CA, May 2023 – Aug 2023
▪ Prototyped a workload replay tool that generates realistic workloads based on existing job statistics, attracting significant interest from multiple internal customers for benchmarking and resource provisioning purposes.	
▪ Implemented a critical multi-metastore feature that resolved a major blocker for the data ingestion system's deployment.	
▪ Uncovered and fixed a subtle concurrency bug in the data infrastructure that could cause data loss in production.	

Research Projects (*selected*)

Cache-Centric Multi-Resource Allocation for Storage Services , Project Leader	Jan 2021 – Dec 2024
▪ Presented a resource allocation framework for multi-tenant storage systems that leverages the demand correlation between cache sizes and other resources (e.g., I/O, network) to optimize resource utilization while maintaining fairness.	
▪ Developed <i>HopperKV</i> , a multi-tenant Redis-based key-value store that caches data from DynamoDB; by judiciously allocating cache sizes among tenants, HopperKV optimizes DynamoDB utilization, achieving up to $1.9\times$ higher throughput.	
▪ Built <i>BunnyFS</i> , a multi-tenant local filesystem for high-performance NVMe SSDs; by optimizing page cache allocations among tenants, BunnyFS delivers up to $1.4\times$ higher throughput.	
Enabling Transaction Priority in Optimistic Concurrency Control , Project Leader	Oct 2021 – Apr 2023
▪ Proposed a lightweight reservation mechanism for optimistic concurrency control (OCC) protocol that protects high-priority transactions from being aborted by low-priority transactions in the case of conflicts.	
▪ Designed and implemented <i>Polaris</i> , an OCC protocol that supports multiple priority levels; benchmarks show it can achieve up to $1.9\times$ higher throughput and $17\times$ lower latency compared to an existing OCC protocol on high-contention workloads.	
MadFS: Per-File Virtualization for Userspace Persistent Memory Filesystems , Project Co-Leader	Oct 2021 – Jan 2023
▪ Proposed a novel <i>per-file virtualization</i> technique for persistent memory filesystems, which encapsulates a set of filesystem functionalities, including metadata management, crash consistency, and concurrency control, fully in userspace; this technique significantly reduces the kernel-crossing overhead on the critical path.	
▪ Built <i>MadFS</i> , a kernel-bypassing persistent memory filesystem based on per-file virtualization, achieving up to $1.5\times$ speedup for LevelDB on the YCSB workload and $1.9\times$ for SQLite on the TPC-C workload.	

Publications

- [1] Chenhao Ye, Shawn Zhong, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau. Cache-Centric Multi-Resource Allocation for Storage Services. In 24th USENIX Conference on File and Storage Technologies. **FAST '26**
- [2] Sambhav Satija, Chenhao Ye, Ranjitha Kosgi, Aditya Jain, Romit Kankaria, Yiwei Chen, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, Kiran Srinivasan. Cloudscape: A Study of Storage Services in Modern Cloud Architectures. In 23rd USENIX Conference on File and Storage Technologies. **FAST '25**

- [3] Chenhao Ye, Wuh-Chwen Hwang, Keren Chen, Xiangyao Yu. Polaris: Enabling Transaction Priority in Optimistic Concurrency Control. In *Proceedings of the 2023 International Conference on Management of Data*. **SIGMOD '23**
- [4] Shawn Zhong*, Chenhao Ye*, Guanzhou Hu, Suyan Qu, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, Michael M. Swift. MadFS: Per-File Virtualization for Userspace Persistent Memory Filesystems. In *21st USENIX Conference on File and Storage Technologies*. (*contributed equally) **FAST '23**
- [5] Yuvraj Patel, Chenhao Ye, Akshat Sinha, Abigail Matthews, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, Michael M. Swift. Using Trāṭr to tame Adversarial Synchronization. In *31st USENIX Security Symposium*. **USENIX Security '22**
- [6] Jing Liu, Anthony Rebello, Yifan Dai, Chenhao Ye, Sudarsun Kannan, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau. Scale and Performance in a Filesystem Semi-Microkernel. In *Proceedings of the ACM SIGOPS 28th Symposium on Operating Systems Principles*. **SOSP '21**

Professional Activities

Journal Reviewer:

- *Journal of Computer Science and Technology (JCST)*.

Artifact Evaluation Committee:

- *ACM Symposium on Operating Systems Principles (SOSP '24)*
- *USENIX Symposium on Operating Systems Design and Implementation (OSDI '24, OSDI '25, OSDI '26)*
- *USENIX Annual Technical Conference (ATC '24)*
- *USENIX Conference on File and Storage Technologies (FAST '24, FAST'26)*

Shadow Program Committee:

- *European Conference on Computer Systems (EuroSys '26)*