Jaechan An (Ahn)

DSLAM (**D**ata **S**ystems **L**ab)
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INTRO

Ph.D. student in Computer Science at the University of Maryland specializing in distributed database systems. Experienced in C/C++ development, performance analysis/optimization, and large-scale data analysis infrastructure. Seeking software engineering or research internships focused on databases, key-value stores, storage systems, or cloud infrastructure.

SKILLS

C/C++, Rust, Typescript, Python, Java, Shell Script, SQL, PostgreSQL, MySQL, RocksDB, MongoDB, Linux, Docker, AWS, Git, gRPC, Google Dataflow

EDUCATION & BACKGROUND

University of Maryland - College Park — *College Park, MD, USA*
PhD Student (GPA: 3.925 / 4.0) — 2024 -
Advisor: Daniel Abadi

Hanyang University, DBOS Lab. — *Seoul, Republic of Korea*
M.S. in Computer Science (GPA: 3.55 / 4.0) — 2021 - 2023
Undergraduate Intern — 2020 - 2021
Advisor: Hyungsoo Jung

Hanyang University — *Seoul, Republic of Korea*
B.S. in Computer Science (GPA: 3.0 / 4.0) — 2014 - 2021

PUBLICATIONS

Deploying Computational Storage for HTAP DBMSs Takes More Than Just Computation Offloading
(*): first author(s)
Kitaek Lee(*), Insoon Jo(*), **Jaechan Ahn**(*), H. Lee, H. Lee, W. Sul, Hyungsoo Jung
VLDB Endowment Inc. International Conference on Very Large Data Bases (VLDB'23)

DIVA: Making MVCC Systems HTAP-Friendly
Jongbin Kim(*), Jaeseon Yu(*), **Jaechan Ahn**, Sooyong Kang, Hyungsoo Jung
ACM SIGMOD International Conference on Management of Data (SIGMOD'22)

Hybrid Transactional/Analytical Processing Amplifies IO in LSM-trees
Jongbin Kim(*), **Jaechan Ahn**, Kitaek Lee, Hyungsoo Jung
Institute of Electrical and Electronics Engineers Access (IEEE ACCESS'22)

Towards Verifiable Network Telemetry without Special Purpose Hardware
Jaechan An(*), Zeying Zhu, Ian Miers, Zaoxing Liu
ACM Workshop on Hot Topics in Networks (HotNets'25)

RESEARCH

Low-latency Multi-writer Distributed Database Systems
• Developing a multi-writer disaggregated database architecture similar to Amazon DSQL that provides stronger isolation (serializability) with reduced latency.

MVCC Databases for Hybrid Transactional/Analytical Processing
• Designed and integrated new mechanisms, leveraging both hardware-assisted (e.g., SmartSSD) and software-based approaches to support HTAP workloads on disk-oriented MVCC databases.
• Mitigated the space amplification issue in MVCC databases under HTAP workloads by re-desiging the GC mechanism, reducing space usage by 93.6% in Sysbench experiments.

Improving Read/Write Amplification of LSM-trees under HTAP workload
• Introduced a new filter layer that operates orthogonally to existing filters (e.g., Bloom filter), reducing read latency by 35.9% in RocksDB.
• Proposed aligned compaction to mitigate write amplification, reducing total disk writes by up to 14.9% under TPC-CH.

WORK EXPERIENCE

Fairy — Full Time Software Engineer Apr. 2023 - Mar. 2024

• Identified and resolved memory inefficiencies in the core C++ library by designing a bounded concurrent memory pool, reducing battery consumption by 10%.
• Built battery testing workflows through scripted instrumentation in the Android app.
• Designed and implemented a data analytics pipeline using Google Dataflow.
• Developed backend services using NestJS and MongoDB.

Naver — Software Engineering Internship Jan. 2019 - Feb. 2019

• Developed front-end features for Naver Map v2 using Angular 2+.
• Implemented dynamic rendering of POIs on the map fetched from the backend server, and built user interactions based on POI types (e.g., line, point, etc.).

MPAG — Full Time Software Engineer Dec. 2017 - Sep. 2018

• Worked as a full-stack developer for MyMusicFive, a global digital music sheet distribution platform, using Angular 2+, Flask, and AWS.

OTHER PROJECTS

Enhancing xv6 Operating System

• Extended MIT's xv6 operating system to support advanced scheduling policies (MLFQ, and Stride scheduling).
• Introduced pthreads-like thread support to reduce context-switch overhead by avoiding full address-space switches and TLB flushes.
• Increased the maximum file size by introducing doubly and triply indirect pointers to the inode structure.

MariaDB Buffer Pool Parallel Initialization

• Identified bottleneck during buffer pool initialization caused by sequential block allocation.
• Implemented a concurrent buffer pool allocator using partitioned multithreading, significantly reducing initialization time.

Concurrent Hash Table Implementations

• Designed and implemented a concurrent hash table supporting multiple synchronization strategies, including per-bucket locking, hand-over-hand locking, optimistic locking, and a lock-free variant.
• Evaluated trade-offs in throughput and scalability under multi-threaded workloads.

Parallel In-place Radix Sort (PARADIS Implementation)

• Implemented an in-place parallel radix sorting algorithm inspired by the PARADIS paper.
• Achieved 4th place in execution performance in an in-class external sorting competition.

AWARDS

Best Capstone Project — HYU, Department of Computer Science 2020

• Analyzed potential performance issues in LSM-tree–based key-value stores and identified bottlenecks in snapshot reads.
• Designed and conducted experiments on RocksDB to verify the performance phenomena, published at *KSC 2020* and *KSC 2021*.
• Project video available on YouTube: https://youtu.be/g0whjVrXNvs

TEACHING

UMD - Teaching Assistant, Database Design (CMSC424) Fall 2025
UMD - Teaching Assistant, Computer and Network Security (CMSC414) Spring 2025
UMD - Teaching Assistant, Cloud Computing (CMSC498B) Fall 2024
Samsung - Teaching Assistant, Database Systems Summer 2022
HYU - Teaching Assistant, Concurrent Programming (ITE4065) Fall 2021 / 2022
HYU - Teaching Assistant, Database Systems (ITE2038) Fall 2021 / 2022
HYU - Teaching Assistant, Operating System (ITE3021) Spring 2021 / 2022

REFERENCE

Daniel Abadi Professor
Department of Computer Science University of Maryland
Ph.D. advisor abadi@umd.edu