Junhyeok Park

Computer System Researcher

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PROFILE

Now I'm a Master's student in Computer Science and Engineering at Sogang University, and a research assistant in DISCOS Laboratory. My goal is to become an awesome computer system researcher who makes the world convenient!

EDUCATION

SOGANG UNIVERSITY
M.S in Computer Science and Engineering (2024.03-present)
→ Advisor: Prof. Youngjae Kim

SOGANG UNIVERSITY
B.S in Computer Science and Engineering (2024.02)
→ CGPA: 4.15/4.50 (Magna Cum Laude, 5th out of 69)

WORK EXPERIENCE

RESEARCH ASSISTANT, DISCOS (Data-Intensive Computing & AI Systems) Laboratory, Sogang University, Seoul (2023.01-present)

PUBLICATION

ByteExpress: A High-Performance and Traffic-Efficient Inline Transfer of Small Payloads over NVMe
J.Park, J.Lee, Y.Kim. [In Proceedings of the 17th ACM Workshop on Hot Topics in Storage and File Systems (**ACM HotStorage**), Boston, MA, USA, July 10-11, 2025] *(pdf) (talk)*
— *Best Paper Award*

KVAccel: A Novel Write Accelerator for LSM-Tree-Based KV Stores with Host-SSD Collaboration
K.Kim*, H.Chung*, S.Ahn*, **J.Park**, S.Jamil, H.Byun, M.Lee, J.Choi, Y.Kim. [In Proceedings of the 39th IEEE International Parallel and Distributed Processing Symposium (**IEEE IPDPS**), Milan, Italy, June 3-7, 2025] *(pdf) (talk)*

Maximizing Interconnect Bandwidth and Efficiency in NVMe-Based Key-Value SSDs with Fine-Grained Value Transfer

J.Park, C.-G.Lee, S.Hwang, S.-J.Cha, W.Chung, Y.Kim. [IEEE Micro Special Issue on Cache Coherent Interconnects and Resource Disaggregation Techniques (**IEEE Micro**), Volume TBD, Number TBD, May-June, 2025] *(pdf)*

Improving SQL Query Execution of Distributed Query Engines on Object-Based Computational Storage through Multi-Layered Offloading

S.Hwang, **J.Park**, J.Ryu, J.Park, J.Lee, J.Noh, S.Yang, W.Chung, Y.Kim. [Presented at the 9th International Parallel Data Systems Workshop (PDSW) Work-In-Progress (WiP), Atlanta, GA, USA, November 17, 2024] *(pdf)* *(talk)*

BandSlim: A Novel Bandwidth and Space-Efficient KV-SSD with an Escape-from-Block Approach

J.Park, C.-G.Lee, S.Hwang, S.Yang, J.Noh, W.Chung, J.Lee, Y.Kim. [In Proceedings of the 53rd International Conference on Parallel Processing (**ICPP**), Gotland, Sweden, August 12-15, 2024] *(pdf)* *(talk)* *(nvramos24)* *(kiise24)*

OctoFAS: A Two-Level Fair Scheduler that Increases Fairness in Network-Based Key-Value Storage

Y.Park, J.Park, **J.Park**, A.Khan, K.Kim, S.-S.Park, Y.Kim. [MDPI Electronics Special Issue on Distributed Computing and Storage Challenges for Emerging Applications (MDPI Electronics), Volume 13, Number 3, February 1, 2024] *(pdf)*

OCTOKV: An Agile Network-based Key-Value Storage System with Robust Load Orchestration

Y.Park, **J.Park**, A.Khan, J.Park, C.-G.Lee, W.Chung, Y.Kim. [In Proceedings of the 31st International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (**MASCOTS**), Stony Brook, NY, USA, October 16-18, 2023] *(pdf)* *(talk)*

PROJECT

SK Hynix & Los Alamos National Laboratory.

Object-based Computational Storage for Accelerating Data Analytics

(2024.01-present) *(sc23)* *(fms24)* *(sc24)* *(ces25)*

My Role: I designed and implemented the full in-storage query processing framework, with a strong focus on horizontally and vertically distributed execution across a network gateway and multiple storage arrays within the object storage system.

Capstone Design Project.

TravelPT: ChatGPT-based Travel Guide Application

(2023.03-2023.06) *(poster)*

My Role: Designed and developed a low-latency, basic Retrieval-Augmented Generation (RAG) pipeline using the OpenAI API and Firebase DB API. At the time (early 2023), this was considered a fairly novel and forward-looking approach.

HONOR + AWARD	Received the Pure Storage Best Paper Award at ACM HotStorage 2025 Workshop (2025.07) Received a Graduate Scholarship from SK hynix Memory Systems Research (2024.06) Albatross Fellowship upon the admission to the Sogang University Graduate School (2024.01) Best Excellence Award at the 2023-1 Sogang Convergence Technology Competition (2023.06)
TEACHING + TALK	Designed and developed new coursework for Embedded Systems Software (CSE4116) at Sogang University, covering the kernel I/O stack, SSD architecture, NVMe protocol, PCIe interconnect, and SSD firmware development on a Xilinx FPGA-based Cosmos+ OpenSSD board (2025.03–present) Optimizing NVMe-Based Key-Value Interfaces and Leveraging KVSSDs: A Comprehensive Study (Special Seminar at Soongsil University, presented by Prof. Youngjae Kim, 2025.04) *(pdf)* State of the Key-Value Computational Solid State Drive (Special Lecture for Advanced Database Systems (CSE6401), Sogang University Graduate School, 2024.04) *(pdf)* TA Experience (Sogang University): Computer Science and Engineering Laboratory II (CSE3016-01, Spring 2025), Operating Systems (CSE4070-01, Fall 2024), Database Systems (CSE4110-02, Spring 2024)
SKILL + INTEREST	**Tool:** Vim, Git, Linux, C, C++, Python, Go, Scala, NVMe, SPDK, Xilinx SDK, AWS SDK, DOCA, gRPC, Spark, DuckDB, RocksDB, Arrow, Parquet, Substrait, Photoshop, draw.io, and etc **Research Interest:** Next-Generation Storage and Memory Devices, File and Storage Systems, Heterogeneous Computing, Database Management, Data Analytics Platforms, and etc
LANGUAGE	**KOREAN:** fluent (native) **ENGLISH:** advanced