

# Juwon Kim

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## Research Interests

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Operating System, Filesystems, Flash storage, Device firmware (Flash Translation Layers), Garbage collection, and Learned index.

## Education

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**Ph.D. Student in Electrical Engineering** *Mar. 2023 – Present*  
Korea Advanced Institute of Science and Technology (KAIST) Daejeon, Korea

- Advisor: Prof. Youjip Won

**M.S. in Electrical Engineering** *Mar. 2021 – Feb. 2023*  
Korea Advanced Institute of Science and Technology (KAIST) Daejeon, Korea

- Thesis: *IPLFS: Log-Structured Filesystem without Garbage Collection*
- Advisor: Prof. Youjip Won

**B.S. in Electrical Engineering** *Mar. 2016 – Feb. 2021*  
Korea Advanced Institute of Science and Technology (KAIST) Daejeon, Korea

- Individually Designed Major in Computer Science and Physics

## Publications

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- [1] **Juwon Kim**, Seungjae Lee, Joontaek Oh, Dongkun Shin, Youjip Won, “D2FS: Device-Driven Filesystem Garbage Collection,” in *Proc. USENIX Conference on File and Storage Technologies (FAST)*, Santa Clara, USA, Feb. 2025.
- [2] Jieun Kim, Joontaek Oh, **Juwon Kim**, Seung Won Yoo, Youjip Won, “OPIMQ: Order Preserving IO Stack for Multi-Queue Block Device,” in *Proc. USENIX Conference on File and Storage Technologies (FAST)*, Santa Clara, USA, Feb. 2025.
- [3] **Juwon Kim**, Dongeon Kim, Seung Won Yoo, Myoengin Cheon, Joontaek Oh, Youjip Won, “lwFSCK: Light-weight Filesystem Check,” in *Proc. ACM Symposium on Applied Computing (SAC)*, Catania, Italy, Mar. 2025.
- [4] **Juwon Kim**, Minsu Jang, Danish Muhammad Teeshen, Joontaek Oh, Youjip Won, “IPLFS: Log-Structured File System without Garbage Collection,” in *Proc. USENIX Annual Technical Conference (ATC)*, San Diego, USA, Jul. 2022.

## Posters and Workshops

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- [1] **Juwon Kim**, Hwanseok Yoo, Youjip Won, “Accelerating Filesystem Garbage Collection for Zoned Flash Storage,” in *Proc. ACM Symposium on Operating Systems Principles (SOSP)*, Seoul, Republic of Korea, Oct. 2025.
- [2] Hwanseok Yoo, **Juwon Kim**, Youjip Won, “Manycore Scalability of Modern Log-Structured Filesystem: Revisited,” in *Proc. ACM Symposium on Operating Systems Principles (SOSP)*, Seoul, Republic of Korea, Oct. 2025.
- [3] **Juwon Kim**, Minsu Jang, Danish Muhammad Teeshen, Joontaek Oh, Youjip Won, “IPLFS: Log-Structured File System without Garbage Collection,” in *Proc. USENIX Conference on File and Storage Technologies (FAST)*, Santa Clara, USA, Feb. 2022.

## Patents

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- [1] Youjip Won and **Juwon Kim**, “Method and Device for Managing Host Area,” Korean Patent Application No. 10-2025-0174419, filed Nov. 2025.
- [2] **Juwon Kim** and Youjip Won, “Storage Device Performing Garbage Collection,” Korean Patent Application No. 10-2025-0090393, filed Jul. 2025. (*Joint filing: SK Hynix & KAIST*)

## Awards & Honors

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- Student Grant (Full), USENIX FAST, USA Feb. 2025
- NVRAMOS 2023 OpenSSD Best Practice Award, Gold Prize, KIISE, Korea Nov. 2023
- Student Grant (Full), USENIX FAST, USA Feb. 2022

## Research Projects

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**Order Preserving Distributed Storage System** *Jun. 2025 – Present*  
NRF, Korea

**Optimizing Filesystem Garbage Collection for Zoned Flash Storage** *Sep. 2024 – Present*  
SNU-SKH Solution Research Center, SK Hynix, Korea

**Device-Driven Filesystem Garbage Collection** *Sep. 2023 – Aug. 2024*  
SNU-SKH Solution Research Center, SK Hynix, Korea

**Collection and Integrated Analysis of Automotive Inter/Intra System Artifacts** *Jan. 2024 – Feb. 2025*  
IITP, Korea

**Future Scalable OS: Log-Structured Filesystem without Garbage Collection** *Jan. 2021 – May 2023*  
IITP, Korea

## Teaching Experience

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- Head TA, Operating Systems and System Programming for EE (EE415), KAIST Sep.–Dec. 2025
- TA, Special Topics in Computer Engineering (EE817), KAIST Feb.–Jun. 2025
- TA, Operating Systems and System Programming for EE (EE415), KAIST Sep.–Dec. 2024
- Head TA, Programming Structure for EE (EE209), KAIST Feb.–Jun. 2024
- TA, Programming Structure for EE (EE209), KAIST Sep.–Dec. 2023
- TA, Programming Structure for EE (EE209), KAIST Feb.–Jun. 2023

## Service

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- Program Chair Assistant, USENIX FAST '24 Sep. 2023 – Sep. 2024

## Technical Skills

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**Systems:** F2FS, flash translation layer, NVMe driver, block I/O layer, ZNS, Page Management Subsystem

**Languages:** C, Python, C++, SQL, Verilog

**Tools:** git, vim, gnuplot, ctags, cscope, ftrace, blktrace