Joontaek Oh

Postdoctoral Researcher, Schoold of CS, UW-Madison, USA

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Research Interest

Operating System, Filesystem, Storage system, Flash Storage, Database systems, Manycore scalability

Education

Korea Advanced Institute of Science and Technologies (KAIST) Daejeon, Korea
Ph.D in Electrical Engineering *Mar. 2020 – Feb. 2024*

Hanyang University Seoul, Korea
Ph.D student, Department of Computer Software *Sep. 2018 – Feb. 2020*

Hanyang University Seoul, Korea
MS in Computer Science *Mar. 2016 – Aug. 2018*

The Korean Academic Credit Bank System Seoul, Korea
BS in Information Security Engineering *Mar. 2013 – Aug. 2015*

Publications

Conferences

1. [**USENIX FAST '25**] Jieun Kim, Joontaek Oh, Juwon Kim, Seung Won Yoo, and Youjip Won, "OPIMQ: Order Preserving IO stack for Multi-Queue Block Device", In Proc. of USENIX Conference on File and Storage Technologies (FAST) 2025, Feb. 25-27, 2025
2. [**USENIX FAST '25**] Juwon Kim, Seungjae Lee, Joontaek Oh, Dongkun Shin, and Youjip Won, "D2FS: Device-Driven Filesystem Garbage Collection", In Proc. of USENIX Conference on File and Storage Technologies (FAST) 2025, Feb. 25-27, 2025
3. [**USENIX FAST '25**] Seung Won Yoo, Joontaek Oh, Myoengin Cheon, Bonmoo Koo, Wonseb Jeong, Hyunsub Song, Hyeonho Song, Donghun Lee, and Youjip Won, "DJFS : Directory-Granularity Filesystem Journaling for Memory-Semantic SSD", In Proc. of USENIX Conference on File and Storage Technologies (FAST) 2025, Feb. 25-27, 2025
4. [**ACM SAC '25**] Juwon Kim, Dongeon Kim, Seung Won Yoo, Myoengin Cheon, Joontaek Oh, and Youjip Won, "lwFSCK: Light-weight Filesystem Check", ACM Symposium on Applied Computing (SAC) 2025, March 31 - April 4, 2025
5. [**IEEE NVMSA '24**] Seungho Lim, Seung Won Yoo, Joontaek Oh, Wonseb Jeong, Hyunsub Song, Hyeonho Song, Donghun Lee, and Youjip Won, "Key-Space Partitioned LSM Tree for CMM-H", In Proc. of IEEE Non-Volatile Memory Systems and Applications Symposium (NVMSA) 2024, Aug 21 – 23, 2024
6. [**USENIX FAST '23**] Joontaek Oh, Seung Won Yoo, Hojin Nam, Changwoo Min and Youjip Won, "CJFS : Concurrent Journaling for Better Scalability", In Proc. of USENIX Conference on File and Storage Technologies (FAST) 2023, Feb, 20-23, 2022

7. [**USENIX ATC '22**] Juwon Kim, Minsu Jang, Danish Muhammad Teeshen, Joontaek Oh, and Youjip Won "IPLFS: Log-Structured File System without Garbage Collection", In Proc. of USENIX Annual Technical Conference (ATC) 2022, July. 11-13, 2022
8. [**ACM SYSTOR '22**] Seung Won Yoo, Joontaek Oh, and Youjip Won "O-AFA: Order Preserving All Flash Array", in Proc. of The ACM International Systems and Storage Conference (SYSTOR), Haifa, Israel, June. 13-15, 2022
9. [**USENIX FAST '22**] Dohyun Kim, Kwangwon Min, Joontaek Oh, and Youjip Won "ScaleXFS: Getting scalability of XFS back on the ring", In Proc. of USENIX Conference on File and Storage Technologies (FAST) 2022, Feb, 22-24, 2022
10. [**USENIX FAST '22**] Joontaek Oh, Sion Ji, Yongjin Kim, and Youjip Won, "exF2FS: Transaction Support in Log-Structured Filesystem", In Proc. of USENIX Conference on File and Storage Technologies (FAST) 2022, Feb, 22-24, 2022
11. [**ICISS '19**] Myeongseon Kim, Joontaek Oh, Youjip won, "Barrier enabled QEMU", In Proc. of ICISS 2019, Tokyo, Japan, Mar. 2019
12. [**USENIX FAST '18**] Youjip Won, Jaemin Jung, Gyeongyeol Choi, Joontaek Oh, Seongbae Son, Jooyoung Hwang, Sangyeun Cho "Barrier Enabled IO Stack for Flash Storage", in proc. of USENIX Conference on File and Storage Technologies (FAST), Oakland, CA, USA, Feb. 12-15, 2018 (Awarded Best Paper)

Journals

1. [**ACM TOS**] Youjip Won, Joontaek Oh, Jaemin Jung, Gyeongyeol Choi, Seongbae Son, Jooyoung Hwang, Sangyeun Cho "Bringing Order to Chaos: Barrier-Enabled I/O Stack for Flash Storage", ACM Transactions on Storage (TOS)
2. [**ACM TOS**] Jinsoo Yoo, Joontaek Oh, Seongjin Lee, Youjip Won, Jin-Yong Ha, Jongsung Lee, Junseok Shim, "OrcFS: Orchestrated File System for Flash Storage", ACM Transactions on Storage (TOS), Vol. 14, Issue 2, Apr, 2018

Posters and Workshops

1. [**ACM APSys '21**] Kyoungho Koo, Joontaek Oh, Kwangwon Min, Youngjin Kwon, Youjip Won, "C2J: Compulsory Compound Transaction for Journaling Filesystem", In Proc. of ACM SIGOPS Asia-Pacific Workshop on Systems (APSys), 2021
2. [**USENIX FAST '19**] Joontaek Oh, Wonjong Lee, Youjip Won, "xF2FS: Supporting Multi-File Transaction in Log-Structured Filesystem", In Proc. of 17th USENIX Conference on File and Storage Technologies (FAST), 2019
3. [**IEEE NVMSA '18**] Joontaek Oh, and Youjip Won. "Embedded DBMS Design for In-Vehicle Information Management." 2018 IEEE 7th Non-Volatile Memory Systems and Applications Symposium (NVMSA). IEEE, 2018.
4. [**USENIX FAST '16**] Jinsoo Yoo, Joontaek Oh, and Youjip Won. "Preserving Bi-Modal Utilization for Segment Cleaning in Modern Log-Structured Filesystem", In Proc. of 14th USENIX Conference on File and Storage Technologies (FAST), 2016

Patents

1. Youjip Won and Joontaek Oh, "On-disk data structure for commit and method of commit with the data structure in log-structured filesystem", KR20220074807A, June 2022
2. Youjip Won and Joontaek Oh, "Method to solve the problem that file operation is blocked because of journal conflict", KR20220074804A, June 2022
3. Youjip Won and Joontaek Oh, "Method and in-memory structure for a file operation processing multiple files", KR20220074806A, June 2022

4. Youjip Won and Joontaek Oh, "Method and apparatus for sending barrier command using dummy IO request", KR20190096838A, Aug. 2019
5. Youjip Won and Joontaek Oh, "Method and apparatus for parallel journaling using conflict page list", KR20190096837A, Aug. 2019

Experience

Postdoctoral Researcher — Sep. 2024 – Present
University of Wisconsin-Madison — *WI, USA*

Postdoctoral Researcher — Mar. 2024 – Aug. 2024
Korea Advanced Institute of Science and Technologies (KAIST) — *Daejeon, Korea*

TA, Programming Structure for EE (EE 209) — Mar. 2021 – June 2021
Korea Advanced Institute of Science and Technologies (KAIST) — *Daejeon, Korea*

TA, Introduction to Operating Systems (EE 415) — Sep. 2020 – Dec. 2020
Korea Advanced Institute of Science and Technologies (KAIST) — *Daejeon, Korea*

TA, Commissioned Education of IO Subsystem — July 2020
Samsung Advanced Technology Training Institute — *Suwon-si, Korea*

TA, Unix Kernel Design (EE 488) — Mar. 2020 – June 2020
Korea Advanced Institute of Science and Technologies (KAIST) — *Daejeon, Korea*

TA, SK Hynix - KAIST ASK Program — Feb. 2020
Korea Advanced Institute of Science and Technologies (KAIST) — *Daejeon, Korea*

TA, Introduction to Operating Systems (EE 415) — Sep. 2019 – Dec. 2019
Korea Advanced Institute of Science and Technologies (KAIST) — *Daejeon, Korea*

TA, Commissioned Education of IO Subsystem — June 2019
Samsung Advanced Technology Training Institute — *Suwon-si, Korea*

TA, Unix Kernel Design (EE 488) — Mar. 2019 – June 2019
Korea Advanced Institute of Science and Technologies (KAIST) — *Daejeon, Korea*

TA, System Programming (CSE 4009) — Sep. 2018 – Dec. 2018
Hanyang University — *Seoul, Korea*

TA, Commissioned Education of IO Subsystem — Aug. 2018
Samsung Advanced Technology Training Institute — *Suwon-si, Korea*

TA, Operating System (ELE 3021) — Mar. 2018 – June 2018
Hanyang University — *Seoul, Korea*

TA, System Programming (CSE 4009) — Sep. 2017 – Dec. 2017
Hanyang University — *Seoul, Korea*

TA, Operating Systems & System Programming (ITE 2032) — Sep. 2016 – Dec. 2016
Hanyang University — *Seoul, Korea*

TA, Commissioned Education of Operating System Aug. 2016
Samsung Electronics *Suwon-si, Korea*

TA, Introduction to Operating System (ELE 3021) Mar. 2016 – June 2016
Hanyang University *Seoul, Korea*

Projects

High-Performance Exabyte Storage Systems | Samsung Electronics May 2022 – May 2024

SNU-SKH Solution Research Center | SK Hynix Sep. 2021 – Aug. 2026

Disaggregated Memory System for Data Center | Samsung Electronics July 2021 – June 2021

Virtualization on Embedded Architecture | Samsung Electronics Jan. 2021 – Dec. 2021

Lock-free Scalable IO Subsystem Design | NRF Jan. 2020 – Dec. 2025

Optimization of Filesystem and DBMS for Data Center | Naver June 2019 – May 2020

Barrier-Enabled IO Stack for NVMe SSD | SK Hynix Nov. 2018 – Oct. 2019

Future Scalable OS | IITP June 2018 – May 2023

Scalable IO Stack for future storage system | NRF June 2017 – Mar. 2020

System Software for Byte Addressable NVM | KEIT/MOTIE Mar. 2016 – May 2017

Awards and Honors

Best Ph.D. student Award | EE Dept., KAIST Apr. 2023

Best TA Award | EE Dept., KAIST Oct. 2020

Best Paper Award | USENIX FAST 2018 Feb. 2018

Technical Skills

Languages: C/C++, Python, SQL (MySQL, SQLite), R

Developer Tools: gcc/g++, gdb, Git, QEMU, gnuplot, vim, Emacs

System knowledge: In-depth knowledge in Linux kernel and EXT4, F2FS, XFS, Ceph, Linux-MD, etc.

References

Prof. Youjip Won | ywon@kaist.ac.kr Dept. of Electrical Engineering, KAIST

Prof. Youngjin Kwon | yjkwon@kaist.ac.kr School of Computing, KAIST

Dr. Changwoo Min | changwoo@igalia.com Igalia