

# Joontaek Oh

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

Avid kernel developer

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## RESEARCH INTEREST

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

## EDUCATION

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**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

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### Conferences

1. [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
2. [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
3. [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
4. [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
5. [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
6. [ICISS '19] Myeongseon Kim, Joontaek Oh, Youjip won, "Barrier enabled QEMU", In Proc. of ICISS 2019, Tokyo, Japan, Mar. 2019

7. [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] Kyoungcho 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

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### Postdoctoral Researcher

*University of Wisconsin-Madison*

Sep. 2024 – Present

*WI, USA*

### Postdoctoral Researcher

*Korea Advanced Institute of Science and Technologies (KAIST)*

Mar. 2024 – Aug. 2024

*Daejeon, Korea*

### TA, Programming Structure for EE (EE 209)

*Korea Advanced Institute of Science and Technologies (KAIST)*

Mar. 2021 – June 2021

*Daejeon, Korea*

<b>TA, Introduction to Operating Systems (EE 415)</b> <i>Korea Advanced Institute of Science and Technologies (KAIST)</i>	Sep. 2020 – Dec. 2020 <i>Daejeon, Korea</i>
<b>TA, Commissioned Education of IO Subsystem</b> <i>Samsung Advanced Technology Training Institute</i>	July 2020 <i>Suwon-si, Korea</i>
<b>TA, Unix Kernel Design (EE 488)</b> <i>Korea Advanced Institute of Science and Technologies (KAIST)</i>	Mar. 2020 – June 2020 <i>Daejeon, Korea</i>
<b>TA, SK Hynix - KAIST ASK Program</b> <i>Korea Advanced Institute of Science and Technologies (KAIST)</i>	Feb. 2020 <i>Daejeon, Korea</i>
<b>TA, Introduction to Operating Systems (EE 415)</b> <i>Korea Advanced Institute of Science and Technologies (KAIST)</i>	Sep. 2019 – Dec. 2019 <i>Daejeon, Korea</i>
<b>TA, Commissioned Education of IO Subsystem</b> <i>Samsung Advanced Technology Training Institute</i>	June 2019 <i>Suwon-si, Korea</i>
<b>TA, Unix Kernel Design (EE 488)</b> <i>Korea Advanced Institute of Science and Technologies (KAIST)</i>	Mar. 2019 – June 2019 <i>Daejeon, Korea</i>
<b>TA, System Programming (CSE 4009)</b> <i>Hanyang University</i>	Sep. 2018 – Dec. 2018 <i>Seoul, Korea</i>
<b>TA, Commissioned Education of IO Subsystem</b> <i>Samsung Advanced Technology Training Institute</i>	Aug. 2018 <i>Suwon-si, Korea</i>
<b>TA, Operating System (ELE 3021)</b> <i>Hanyang University</i>	Mar. 2018 – June 2018 <i>Seoul, Korea</i>
<b>TA, System Programming (CSE 4009)</b> <i>Hanyang University</i>	Sep. 2017 – Dec. 2017 <i>Seoul, Korea</i>
<b>TA, Operating Systems &amp; System Programming (ITE 2032)</b> <i>Hanyang University</i>	Sep. 2016 – Dec. 2016 <i>Seoul, Korea</i>
<b>TA, Commissioned Education of Operating System</b> <i>Samsung Electronics</i>	Aug. 2016 <i>Suwon-si, Korea</i>
<b>TA, Introduction to Operating System (ELE 3021)</b> <i>Hanyang University</i>	Mar. 2016 – June 2016 <i>Seoul, Korea</i>

## PROJECTS

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<b>High-Performance Exabyte Storage Systems</b>   Samsung Electronics	May 2022 – May 2024
<b>SNU-SKH Solution Research Center</b>   SK Hynix	Sep. 2021 – Aug. 2026
<b>Disaggregated Memory System for Data Center</b>   Samsung Electronics	July 2021 – June 2021
<b>Virtualization on Embedded Architecture</b>   Samsung Electronics	Jan. 2021 – Dec. 2021
<b>Lock-free Scalable IO Subsystem Design</b>   NRF	Jan. 2020 – Dec. 2025

<b>Optimization of Filesystem and DBMS for Data Center</b>   Naver	June 2019 – May 2020
<b>Barrier-Enabled IO Stack for NVMe SSD</b>   SK Hynix	Nov. 2018 – Oct. 2019
<b>Future Scalable OS</b>   IITP	June 2018 – May 2023
<b>Scalable IO Stack for future storage system</b>   NRF	June 2017 – Mar. 2020
<b>System Software for Byte Addressable NVM</b>   KEIT/MOTIE	Mar. 2016 – May 2017

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## AWARDS AND HONORS

<b>Best Ph.D. student Award</b>   EE Dept., KAIST	Apr. 2023
<b>Best TA Award</b>   EE Dept., KAIST	Oct. 2020
<b>Best Paper Award</b>   USENIX FAST 2018	Feb. 2018

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## 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.

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## REFERENCES

<b>Prof. Youjip Won</b>   ywon@kaist.ac.kr	Dept. of Electrical Engineering, KAIST
<b>Prof. Youngjin Kwon</b>   yjkwon@kaist.ac.kr	School of Computing, KAIST
<b>Dr. Changwoo Min</b>   changwoo@igalia.com	Igalia