<Professor Youjip Won's Lab.>

OSLab Operating Systems Laboratory

■ **Contact information**

Professor	**Email: ywon@kaist.ac.kr**	**TEL : 042-350-7456**
Lab.	**Email: ehgus421210@kaist.ac.kr**	**TEL : 042-350-7613**
Website	**https://oslab.kaist.ac.kr**	

■ **Current state of the Lab. (in 2025 Spring Semester)**

Postdoctoral Fellows : 0 PhD Students: 8 Master's Student: 5

■ **Research Areas**

We hack.

1. Operating System Design

We overhaul the operating system kernel for performance and scalability under newly emerging hardware; manycore system, ultra-low-latency storage device and byte-addressable non-volatile memory. We redesign the memory management module, the filesystem, the block device layer and the storage device firmware for manycore and Ultra-low-latency storage device.

2. Bigdata system

We optimize the big-data storage engine such as MongoDB, Rocksdb and levelDB. The log-structured merge and graph DB lie at the core of the key-value management system. These data structures cannot well be used in large scale big data system due to its frequent storage interaction and flush overhead. Industry and academia altogether seek for a new solution to meet the demand from the big-data application.

3. Machine Learning System

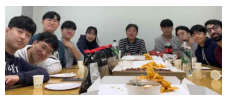
The entire machine learning pipeline consists of data ingestion, data cleaning, data tagging, learning and inference. The current machine learning pipeline suffers from a fair amount of redundant data copies, the coarse grain CPU/graph scheduling, unnecessary synchronization among the heterogeneous GPU devices with widely different computing capability. As a system developer, we orchestrate the behaviors of the individual software components in the machine learning pipeline and eliminate all inefficiencies in the existing ML system.

■ **Recommended courses & Career after graduation**

- Recommended courses to join the group: C/C++, Data Structure and Algorithms, Operating Systems
- Career: Professor at academia, researcher at government funded research organization, system software developer at the software company such as Google, Facebook, at the smartphone manufacturers such as Samsung and LG, or at the semiconductor Industry such as Samsung and Intel

■ **Introduction to other activities besides research**

- Each student has the opportunity to attend international conferences a few times a year (USENIX FAST, USENIX ATC, EuroSys and etc.).
- Once a month, the group members dine out and enjoy drinks together. We often visit an excellent beer pub near the KAIST campus to spend quality time.



■ **Introduction to the Lab.**

OSLab@KAIST is the world's leading research group at the forefront of operating system design for Flash storage and NVRAM. OSLab has been leading the IO stack optimization for the smartphone for several years. The techniques proposed by OSLab have been adopted by Google Android platform (Best Paper, USENIX ATC 2013). OSLab has also contributed numerous open-source tools that are widely utilized in Android research worldwide.

One of OSLab's significant achievements is their successful proposal of a new IO subsystem design for Flash storage, which provides separate support for ordering guarantees (Best Paper, USENIX FAST 2018). Separating the ordering guarantee from the durability guarantee has been a long-standing challenge in the systems research community for more than 50 years.

For passionate kernel developers and system hackers, OSLab offers an ideal environment to expand their limit and contribute to pioneering research.

■ **Recent research achievements ('20~'25)**

International journals: 0, International conferences: 16, Domestic journals: 1, Domestic conferences: 0

10 publications in top-tier conferences (major conferences: USENIX ATC, FAST)