

RESEARCH INTERESTS

- **System software**
 - Distributed file system
 - Operating system
 - Smart devices (SmartNIC, SmartSSD)
 - Virtualization

SKILLS

- **Programming:**
 - C, Java, Python, Shell
 - File system, RDMA, Persistent memory, Virtualization, ARM-based SmartNIC
- **Languages:**
 - English, Korean (Korean citizen)

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST)

Ph.D. Integrated master's/doctoral program in School of Computing

Daejeon, South Korea

Mar 2013 – Feb 2022

- Computer Architecture and Systems Laboratory
- Advisor: Seungryoul Maeng, Youngjin Kwon

Korea Advanced Institute of Science and Technology (KAIST)

B.S. Double-majored in Computer Science and Management Science

Daejeon, South Korea

Feb 2007 – Feb 2012

EXPERIENCE

Korea Advanced Institute of Science and Technology (KAIST)

Postdoctoral researcher at Computer Architecture and Systems Laboratory

Daejeon, South Korea

Mar 2022 – Current

Software developer/Startup co-founder

Android application developer

Seoul, South Korea

Jun 2011 - Feb 2013

TestMidas Co., Ltd

Internship

Daejeon, South Korea

Jun 2009 - Aug 2009

- Seminar on *Writing Solid Code* by Stephen A. Maguire
- *Wine* source code analysis

CONFERENCE AND WORKSHOP PAPERS

Kim, Jongyul, Insu Jang, Waleed Reda, Jaeseong Im, Marco Canini, Dejan Kostić, Youngjin Kwon, Simon Peter, and Emmett Witchel. "LineFS: Efficient SmartNIC Offload of a Distributed File System with Pipeline Parallelism". *13th Annual Non-Volatile Memories Workshop 2022*. (NVMW 2022).

Kim, Jongyul, Insu Jang, Waleed Reda, Jaeseong Im, Marco Canini, Dejan Kostić, Youngjin Kwon, Simon Peter, and Emmett Witchel. "LineFS: Efficient SmartNIC Offload of a Distributed File System with Pipeline Parallelism". *Proceedings of the ACM SIGOPS 28th Symposium on Operating Systems Principles*. **Best paper awards**. (SOSP 2021).

- Anderson, Thomas E., Marco Canini, **Jongyul Kim**, Dejan Kostić, Youngjin Kwon, Simon Peter, Waleed Reda, Henry N. Schuh, and Emmett Witchel. “Assise: Performance and Availability via Client-local NVM in a Distributed File System”. *12th Annual Non-Volatile Memories Workshop 2021*. **Co-student author**. (NVMW 2021).
- Anderson, Thomas E., Marco Canini, **Jongyul Kim**, Dejan Kostić, Youngjin Kwon, Simon Peter, Waleed Reda, Henry N. Schuh, and Emmett Witchel. “Assise: Performance and Availability via Client-local NVM in a Distributed File System”. *14th USENIX Symposium on Operating Systems Design and Implementation*. **Co-student author**. (OSDI 2020).
- Im, Jaeseong, **Jongyul Kim**, Jonguk Kim, Seongwook Jin, and Seungryoul Maeng. “On-demand virtualization for live migration in bare metal cloud”. *Proceedings of the 2017 Symposium on Cloud Computing*. (SoCC 2017).
- Im, Jaeseong, **Jongyul Kim**, and Seungryoul Maeng. “Whole System Checkpoint-recovery Mechanism in Bare-metal In-memory System”. *Korea Computer Congress 2017*. (KCC 2017).

JOURNALS

- Im, Jaeseong, **Jongyul Kim**, Youngjin Kwon, and Seungryoul Maeng. “On-demand Virtualization for Post-copy OS Migration in Bare-metal Cloud”. *IEEE Transactions on Cloud Computing* (2022). **Impact factor: 5.938** by WOS.

SERVICE

- EuroSys 2023 Shadow PC 2023
- ACM Transactions on Storage review 2022

TEACHING

- **Teaching Assistant** at KAIST
 - Digital System and Lab (CS211) Spring 2014 (Head), Spring 2015 (Head)
Lab sessions : VHDL (Hardware description language) programming.
 - Embedded Computer Systems (CS310) Fall 2013 (Head), Fall 2014, Fall 2015
Lab sessions: VHDL and Arduino programming.
 - Embedded Computing (SEP561) Spring 2014 (Head), Spring 2015, Spring 2019
Lab sessions : VHDL programming.
- **Mentoring** at KAIST
 - Jaehwan Lee Aug 2021 - Dec 2021
Multi-thread support in the persistent-memory-based file system.
 - Guseul Heo Aug 2021 - Dec 2021
Replacing the extent tree with hash-based file mapping in the persistent-memory-based file system.
 - Donggeun Kim Jan 2022 - Aug 2022
Replacing the extent tree with hash-based file mapping in the persistent-memory-based file system.

PROJECTS

- High-performance Exabyte Storage Systems - Samsung Computational Storage Research
Samsung Electronics Device Solutions (Samsung DS Division) Oct 2022 – Current

Lustre Distributed File System Performance Optimization leveraging SmartNIC In collaboration with <i>Samsung Advanced Institute of Technology (SAIT)</i>	May 2022 – Dec 2022
Efficient and Scalable Distributed File System Leveraging Emerging HW Technology <i>National Research Foundation of Korea (NRF)</i>	Mar 2020 – Feb 2023
New Cloud System Design combining Virtualized Cloud and Bare-metal Cloud <i>National Research Foundation of Korea (NRF)</i>	Jun 2016 – May 2019
UX-oriented Mobile SW Platform <i>Institute of Information & Communications Technology Planning & Evaluation (IITP)</i>	Apr 2013 – Aug 2016

AWARDS

- 2022 Spring KAIST breakthroughs (Biannual Engineering Research Webzine) Apr 2022
- KAIST Best dissertation award Feb 2022
- SOSP 2021 Best paper awards Oct 2021
- 2014 Fall Best teaching assistant awards March 2015
- 2013 Fall Best teaching assistant awards March 2014

ARTICLES

- “Toward future cloud computing: Accelerating cloud file systems using programmable network cards.” *KAIST Breakthroughs (Biannual Engineering Research Webzine Spring 2022)* Spring 2022
- “An efficient distributed file system leveraging local persistent memory.” *Communications of the Korean Institute of Information Scientists and Engineer (Communications of KIISE July 2021)* Jul 2021

INVITED TALKS

- “Persistent-memory-based Distributed File System and SmartNIC Offloading”, EIRIC (*Electronic & Information Research Information Center*) Seminar. Jun 2022
- “LineFS: Efficient SmartNIC Offload of a Distributed File System with Pipeline Parallelism”, Top conference session in *Korea Software Congress 2021 (KSC 2021)*. Dec 2021
- “LineFS: Efficient SmartNIC Offload of a Distributed File System with Pipeline Parallelism”, *The 28th ACM Symposium on Operating Systems Principles (SOSP 2021)*. Oct 2021

PATENTS

- KO, To be decided, “COMPUTABLE NETWORK INTERFACE CARD AND ELECTRONIC APPARATUS INCLUDING THE SAME”, Dec 2022
- KO, 10-2022-0165086, “METHOD FOR MANAGING MEMORY AND COMPUTER DEVICE FOR THE SAME”, Nov 2022