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Professor

School of Software

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Education

Doctor of Philosophy School of Computer Science and Engineering, Seoul National University, Seoul, Korea, Aug. 2007.

Master of Science School of Computer Science and Engineering, Seoul National University, Seoul, Korea, Feb. 2002.

Bachelor of Science Department of Computer Engineering, Seoul National University, Seoul, Korea, Feb. 2000.

Academic/Teaching Experience

Professor School of Software, Kookmin University, Seoul, Korea, Sept. 2024 to present.

Associate Professor School of Computer Science, Kookmin University, Seoul, Korea, Sept. 2018 to Aug. 2024.

Assistant Professor School of Computer Science, Kookmin University, Seoul, Korea, Mar. 2015 to Aug. 2018.

Research Professor Department of Computer Science and Engineering, Ewha Womans University, Seoul, Korea, Mar. 2010 to Feb. 2015.

Postdoctoral Researcher Department of Computer Science and Engineering, Pennsylvania State University, State College, PA, Feb. 2009 to Feb. 2010.

Postdoctoral Researcher School of Computer Science and Engineering, Seoul National University, Seoul, Korea, Oct. 2007 to Dec. 2008.

Teaching Assistant School of Computer Science and Engineering, Seoul National University, Seoul, Korea, May 2002 to Feb. 2006.

Research Interests

- I/O completion optimization for high-performance storage devices
- Virtualized I/O and storage performance
- Storage security (ransomware defense)
- SSD/NVM performance optimization and application launch acceleration
- Energy-efficient memory and storage systems

Service to Professional Associations

- Technical Program Committee, IEEE International Conference on Networking, Architecture, and Storage (NAS), 2012.
- Program Committee, NVRAMOS Workshop, 2012–2018.
- Poster Selection Committee Member, ASPDAC Student Forum, 2010.
- Reviewer, ACM Journal on Emerging Technologies in Computing Systems (JETC).
- Reviewer, ACM Transactions on Embedded Systems (TECS).
- Reviewer, ACM Transactions on Design Automation of Electronic Systems (TODAES).
- Reviewer, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD).
- Reviewer, IEEE Transactions on Computers (TC).
- Reviewer, Journal of Low Power Electronics (JOLPE).
- Reviewer, Journal of Computer Science and Technologies (JCST).
- Reviewer, Design, Automation and Test in Europe (DATE), 2010.
- Reviewer, International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), 2007.
- Reviewer, Design & Technology of Integrated Systems (DTIS), 2007.
- Reviewer, Asia and South Pacific Design Automation Conference (ASPDAC), 2004 and 2008.
- Reviewer, International Symposium on Low-Power Electronics and Design (ISLPED), 2003.

Academic Honors and Awards

- Korea Research Foundation, Postdoctoral Fellowship Recipient, 2009.
- Design Automation Conference, ACM SIGDA PhD Forum Travel Grant Recipient, 2008.
- Design Automation Conference, Speaker’s Travel Grant Recipient, 2007.
- ACM SIGDA/DAC University Booth, Travel Grant Recipient, 2005.

Publications

International Conferences

1. Dongjoo Seo, Jihyeon Jung, Yeohwan Yoon, Ping-Xiang Chen, Yongsoo Joo, Sung-Soo Lim, and Nikil Dutt, “DPAS: A Prompt, Accurate and Safe I/O Completion Method for SSDs,” in *Proceedings of the USENIX Conference on File and Storage Technologies (FAST)*, Santa Clara, USA, February, 2026.
2. Dongjoo Seo, Yongsoo Joo, and Nikil Dutt, “Improving Virtualized I/O Performance by Expanding the Polled I/O Path of Linux,” in *Proceedings of the ACM Workshop on Hot Topics in Storage and File Systems (HotStorage)*, pp. 31–37, Santa Clara, USA, July, 2024.

3. Yongsoo Joo, Junhee Ryu, Sangsoo Park, and Kang G. Shin, "FAST: Quick Application Launch on Solid-State Drives," in *Proceedings of the USENIX Conference on File and Storage Technologies (FAST)*, pp. 259–272, San Jose, USA, February, 2011.
4. Yongsoo Joo, Dimin Niu, Xiangyu Dong, Guangyu Sun, Naehyuck Chang, and Yuan Xie, "Energy- and Endurance-Aware Design of Phase Change Memory Caches," in *Proceedings of the Design Automation and Test in Europe Conference (DATE)*, pp. 136–141, Dresden, Germany, March, 2010.
5. Guangyu Sun, Yongsoo Joo, Yibo Chen, Dimin Niu, Yuan Xie, Yiran Chen, and Helen Li, "A Hybrid Solid-State Storage Architecture for the Performance, Energy Consumption, and Lifetime Improvement," in *Proceedings of the International Symposium on High Performance Computer Architecture (HPCA)*, pp. 1–12, Bangalore, India, January, 2010.
6. Yongsoo Joo, Youngjin Cho, Kyungsoo Lee and Naehyuck Chang, "Improving Application Launch Times with Hybrid Disks," in *Proceedings of the IEEE/ACM/IFIP International Conference on Hardware-Software Codesign and System Synthesis (CODES+ISSS)*, pp. 373–382, Grenoble, France, October, 2009.
7. Youngjin Cho, Younghyun Kim, Yongsoo Joo, Kyungsoo Lee and Naehyuck Chang, "Simultaneous Optimization of Battery-Aware Voltage Regulator Scheduling with Dynamic Voltage and Frequency Scaling," in *Proceedings of the IEEE/ACM International Symposium on Low Power Electronics and Design (ISLPED)*, pp. 309–314, Bangalore, India, August, 2008.
8. Yongsoo Joo, Youngjin Cho, Donghwa Shin and Naehyuck Chang, "Energy-Aware Data Compression for Multi-Level Cell (MLC) Flash Memory," in *Proceedings of the ACM/IEEE Design Automation Conference (DAC)*, pp. 716–719, San Diego, USA, June, 2007.
9. Yongsoo Joo, Yongseok Choi, Chanik Park, Sung Woo Chung, Eui-Young Chung and Naehyuck Chang, "Demand Paging for OneNAND Flash eXecute-In-Place," in *Proceedings of the IEEE/ACM/IFIP International Conference on Hardware-Software Codesign and System Synthesis (CODES+ISSS)*, pp. 229–234, Seoul, Korea, October, 2006.
10. Yongsoo Joo, Yongseok Choi, Hojun Shim, Hyung Gyu Lee and Naehyuck Chang, "Energy exploration and reduction of SDRAM memory systems," in *Proceedings of the ACM/IEEE Design Automation Conference (DAC)*, pp. 892–897, New Orleans, June, 2002.

International Journals

1. Yongsoo Joo, Yeohwan Yoon, and Jong Ho Choi, "A Memory-Efficient Overwrite Detection Method for Ransomware-Proof SSDs," *IEICE TRANSACTIONS on Information and Systems*, Vol. 106, Issue 8, pp. 1283–1286, August, 2023.
2. Yongsoo Joo, Dongjoo Seo, Dongyun Shin, and Sung-Soo Lim, "Enlarging I/O Size for Faster Loading of Mobile Applications," *IEEE Embedded Systems Letters*, Vol. 12, Issue 2, pp. 50–53, June, 2020.
3. Yongsoo Joo, Sangsoo Park, and Hyokyung Bahn, "Exploiting I/O Reordering and I/O Interleaving to Improve Application Launch Performance," *ACM Transactions on Storage*, Vol. 13, Issue 1, pp. 8:1–8:17, March, 2017.
4. Yongsoo Joo, Sangsoo Park, and Hyokyung Bahn, "Application Prefetcher Design Using Both I/O Reordering and I/O Interleaving," *IEICE Transactions on Information and Systems*, Vol. E98–D, Issue 12, pp. 2317–2321, December, 2015.
5. Yongsoo Joo, Junhee Ryu, Sangsoo Park, Heonshik Shin, and Kang G. Shin, "Rapid Prototyping and Evaluation of Intelligence Functions of Active Storage Devices," *IEEE Transactions on Computers*, Vol. 63, Issue 9, pp. 2356–2368, September, 2014.

6. Yongsoo Joo and Sangsoo Park, "A Hybrid PRAM and STT-RAM Cache Architecture for Extending the Lifetime of PRAM Caches," *IEEE Computer Architecture Letters*, Vol. 12, Issue 2, pp. 55–58, July–December, 2013.
7. Yongsoo Joo, Junhee Ryu, Sangsoo Park, and Kang G. Shin, "Improving Application Launch Performance on Solid State Drives," *Journal of Computer Science and Technology*, Vol. 27, Issue 4, pp. 727–743, July, 2012.
8. Junhee Ryu, Yongsoo Joo, Sangsoo Park, Heonshik Shin, and Kang G. Shin, "Exploiting SSD Parallelism to Accelerate Application Launch on SSDs," *IET Electronics Letters*, Vol. 47, Issue 5, pp. 313–315, March, 2011.
9. Yongsoo Joo, Yongseok Choi, Jaehyun Park, Chanik Park, Sung Woo Chung, Eui-Young Chung and Naehyuck Chang, "Energy and Performance Optimization of Demand Paging with OneNAND Flash," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, Vol. 27, Issue 11, pp. 1969–1982, November, 2008.
10. Yongsoo Joo, Youngjin Cho, Donghwa Shin, Jaehyun Park and Naehyuck Chang, "An Energy Characterization Platform for Memory Devices and Energy-Aware Data Compression for Multi-Level Cell Flash Memory," *ACM Transactions on Design Automation of Electronic Systems*, Vol. 13, Issue 3, pp. 1–29, July, 2008.
11. Ikhwan Lee, Yongseok Choi, Youngjin Cho, Yongsoo Joo, Hyeonmin Lim, Hyung Gyu Lee, Hojun Shim and Naehyuck Chang, "Web-based energy exploration tool for embedded systems," *IEEE Design and Test of Computers*, Vol. 21, Issue 6, pp. 572–586, November–December, 2004.
12. Hojun Shim, Yongsoo Joo, Yongseok Choi, Hyung Gyu Lee and Naehyuck Chang, "Low-Energy Off-Chip SDRAM Memory Systems for Embedded Applications," *ACM Transactions on Embedded Computing Systems, Special Issue on Memory Systems*, Vol. 2, Issue 1, pp. 98–130, February, 2003.
13. Dongkun Shin, Hojun Shim, Yongsoo Joo, Han-Saem Yun, Jihong Kim and Naehyuck Chang, "Energy monitoring tool for low-power embedded programs," *IEEE Design and Test of Computers*, Vol. 19, Issue 4, pp. 7–17, July–August, 2002.

Domestic Journals

1. Ingu Kang, Yongsoo Joo, and Sung-Soo Lim, "Analysis of I/O Response Time Throughout NVMe Driver Implementation Architectures," in *IEMEK Journal of Embedded Systems and Applications*, Vol. 12, Issue 3, pp. 139–147, 2017.
2. Yongsoo Joo, Myeung-Heo Kim, In-Kyu Han, and Sung-Soo Lim, "Cache Simulator Design for Optimizing Write Operations of Nonvolatile Memory Based Caches," in *IEMEK Journal of Embedded Systems and Applications*, Vol. 11, Issue 2, pp. 87–95, 2016.
3. Yongsoo Joo, Jaehyun Park, Sung Woo Chung, Eui-Young Chung and Naehyuck Chang, "Delayed Dual Buffering: Reducing Page Faults in Demand Paging for OneNAND Flash Memory," in *Journal of the Institute of Electronics Engineers of Korea*, Vol. 44, Issue 3, pp. 43–51, 2007.

Patents

US Patents

1. Yongsoo Joo, "Apparatus and Method for Processing Input/Output Completion of Storage Device," US Patent Application US 2026/0030187 A1, 2026 (pending).
2. Yongsoo Joo, "Tracking Apparatus and Method of I/O Latency for Storage Devices," US Patent US 11,768,532 B2, September, 2023.
3. Naehyuck Chang, Hojun Shim, Yongsoo Joo, Yongseok Choi, and Hyung Gyu Lee, "Memory System and Method of Managing a Memory System," US Patent Application US 2005/0081002 A1, 2005.

KR Patents

1. Yongsoo Joo, “Hybrid Interrupt Processing Device and Method,” KR Patent 10-2919645, January, 2026.
2. Yongsoo Joo, “Tracking Apparatus and Method of I/O Latency for Storage Devices,” KR Patent 10-2891186, November, 2025.
3. Yongsoo Joo, “Apparatus and Method for Processing Input/Output Completion of Storage Device,” KR Patent Application 10-2024-0098049, 2024 (pending).
4. Yongsoo Joo, Sung-Soo Lim, Dongjoo Seo, and Dongyun Shin, “I/O Optimization Apparatus and Method for Improving Loading Performance of an Application,” KR Patent 10-2202211, January, 2021.

Projects

- Research on High Performance and Scalable Manycore Operating System, IITP, 2018–2021.
- Detecting Ransomware Based on Block I/O Behavior, IITP, 2018–2019.
- Analyzing the Storage I/O Behavior of Applications’ Executable Files, National Research Foundation (NRF) Basic Science Research Program, 2018–2023.
- Performance Improvement of NVMe-based Flash Memory Storage, LG Electronics, 2015–2016.
- Application Prefetcher Design for Improving Application Launch Performance, National Research Foundation (NRF) Basic Science Research Program, 2015–2018.
- Building an Evaluation Platform for Intelligent Data Storage Devices, National Research Foundation (NRF) Basic Science Research Program, 2011–2014.
- Energy and performance optimization of advanced flash memory devices, National Research Foundation (NRF) Overseas Postdoctoral Fellowship Program, 2009–2010.
- Design space exploration of advanced flash memory devices, Samsung Electronics, 2007–2008.
- Energy measurement and characterization of memory devices and systems for system-level low-power design, Samsung Electronics, 2005–2006.
- High-speed HW/SW SoC co-simulation tool and network address translation (NAT) performance optimization, Samsung Electronics, 2003–2004.
- Development of Compact-PCI-based microprocessor boards, Woori Technology Inc., 2001–2002.
- Flash memory board using VME bus, Woori Technology Inc., 2001–2002.
- Development of tera-byte RAID storage server, Institute of Information Technology Assessment (IITA), 2000.