

Sang-Hoon Kim

CONTACT INFORMATION

Systems Software Research Group

The Bradley Department of Electrical and Computer Engineering
Virginia Polytechnic Institute and State University

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Blacksburg, VA 24061
United States

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RESEARCH EXPERIENCE

Postdoctoral Associate, Virginia Tech, United States Nov. 2016 – present

- Working with Professor Binoy Ravindran in Systems Software Research Group

Postdoctoral Researcher, Sungkyunkwan University, South Korea

Sep. 2016 – Oct. 2016

- Worked with Professor Jin-Soo Kim in Computer Systems Laboratory

EDUCATION

Ph.D. in Computer Science, KAIST, South Korea

Aug. 2016

- Integrated Master's and Doctoral Degree Program
- Advisors: Professor Seungryoul Maeng and Professor Jin-Soo Kim
- Thesis: Application-aware Memory Management for Mobile Devices

B.S. in Computer Science, KAIST, South Korea

Feb. 2002

INDUSTRIAL EXPERIENCE

Nilex International, Seoul, South Korea

- Part-time consultant
- Full-time software engineer

Sep. 2005 – Nov. 2005

May 2003 – May 2005

Telpion, Incheon, South Korea

- Full-time software engineer

Mar. 2002 – Apr. 2003

TEACHING EXPERIENCE

Lecturer

- ECE5984 Virtualization Technologies

Virginia Tech, Spring 2018

Guest lecturer

- ECE4984/5984 Linux Kernel Programming
- SWE3004 Operating Systems
- SSE3044 Operating Systems

Virginia Tech, Spring 2017

Sungkyunkwan University, Spring 2016

Fall 2013

Teaching assistant

KAIST, Mar. 2006 – Dec. 2008

- CS330 Operating System (Head TA)
- CS202 Problem Solving
- CS230 System Programming
- CS230 System Programming (Head TA)
- CS230 System Programming
- CC510 Introduction to the Computer Science

Fall 2008

Spring 2008

Fall 2007

Spring 2007

Fall 2006

Spring 2006

HONORS AND
AWARDS

- Excellent Teaching Assistant Award, KAIST Department of CS Feb. 2008
- Excellent Teaching Assistant Award, KAIST Department of CS Sep. 2007
- Outstanding Employee Award, Nilex International Oct. 2003
- KAIST Student Fellowship, Korea Government Mar. 2006 – Jan. 2012
- KAIST Student Fellowship, Korea Government Mar. 1996 – Dec. 1999

PUBLICATIONS

International conferences and workshops

- **Sang-Hoon Kim**, Jinkyu Jeong, and Jin-Soo Kim, “*Application-aware Swapping for Mobile Systems*,” in Proceedings of the 2017 International Conference on Embedded Software (EMSOFT’17), Seoul, South Korea, October 15-20, 2017.
 - Also in ACM Transactions on Embedded Computing Systems, Vol. 16, Issue 5s, No. 182, October 2017.
- Pierre Olivier, **Sang-Hoon Kim**, and Binoy Ravindran, “*OS Support for Thread Migration and Distribution in the Fully Heterogeneous Datacenter*,” in Proceedings of the 16th Workshop on Hot Topics in Operating Systems (HotOS XVI), Whistler, British Columbia, Canada, May 7-10, 2017.
- Sejun Kwon, **Sang-Hoon Kim**, Hyeong-Jun Kim, and Jin-Soo Kim, “*LZ4m: A Fast Compression Algorithm for In-Memory Data*,” in Proceedings of the 34th IEEE International Conference on Consumer Electronics (ICCE’17), Las Vegas, TX, USA, January 11-13, 2017.
- Sejun Kwon, **Sang-Hoon Kim**, Jin-Soo Kim, and Jinkyu Jeong, “*Managing GPU Buffers for Caching More Apps in Mobile Systems*,” in Proceedings of the 2015 ACM SIGBED International Conference on Embedded Software (EMSOFT’15), Amsterdam, The Netherlands, October 4-9, 2015.
- Sangwook Kim, Hwanju Kim, **Sang-Hoon Kim**, Joonwon Lee, and Jinkyu Jeong, “*Request-Oriented Durable Write Caching for Application Performance*,” in Proceedings of the 2015 USENIX Annual Technical Conference (USENIX ATC’15), Santa Clara, CA, USA, July 8-10, 2015.
- **Sang-Hoon Kim**, Sejun Kwon, Jin-Soo Kim, and Jinkyu Jeong, “*Controlling Physical Memory Fragmentation in Mobile Systems*,” in Proceedings of the 2015 ACM SIGPLAN International Symposium on Memory Management (ISMM’15) Portland, OR, USA, June 14, 2015.
 - Also in ACM SIGPLAN Notices, Vol. 50, Issue 11, pp. 1–14, November 2015.
- Jung-Hoon Kim, **Sang-Hoon Kim**, and Jin-Soo Kim, “*Subpage Programming for Extending the Lifetime of NAND Flash Memory*,” in Proceedings of the 18th Conference on Design, Automation and Test in Europe (DATE’15), Grenoble, France, March 9-13, 2015.
- Young-Sik Lee, **Sang-Hoon Kim**, Jin-Soo Kim, Jaesoo Lee, Chanik Park and Seungryoul Maeng, “*OSSD: A Case for Object-based Solid State Drives*,” in Proceedings of the 29th IEEE Conference on Massive Data Storage (MSST’13), Long Beach, CA, USA, May 6, 2013.
- **Sang-Hoon Kim**, Jin-Soo Kim, and Seungryoul Maeng, “*Using Solid State Drives (SSDs) for Virtual Block Devices*,” in Proceedings of the 2nd Workshop on Runtime Environments, Systems, Layering and Virtualized Environments (RESOLVE’12), London, UK, March 3-7, 2012.

- **Sang-Hoon Kim**, Dawoon Jung, Jin-Soo Kim, and Seungryoul Maeng, “*Hetero-Drive: Reshaping the Storage Access Pattern of OLTP Workload Using SSD*,” in Proceedings of the 4th International Workshop on Software Support for Portable Storage (IWSSPS’09), pp.13–17, Grenoble, France, October 15, 2009.
- **Sang-Hoon Kim**, Youngjae Lee, and Jin-Soo Kim, “*FlexRPC: A Flexible Remote Procedure Call Facility for Modern Cluster File Systems*,” in Proceedings of the 9th IEEE International Conference on Cluster Computing (CLUSTER’07), Austin, TX, USA, September 17-20, 2007.

Journals

- Jung-Hoon Kim, **Sang-Hoon Kim**, and Jin-Soo Kim, “*Utilizing Subpage Programming to Prolong the Lifetime of Embedded NAND Flash-based Storage*,” IEEE Transactions on Consumer Electronics, Vol. 64, Issue 1, pp-1–9, February 2018.
- **Sang-Hoon Kim**, Jinhyuk Lee, and Jin-Soo Kim, “*GCMix: An Efficient Data Protection Scheme Against the Paired Page Interference on MLC NAND Flash Memory*,” ACM Transactions on Storage, Vol. 13, Issue 4, December 2017.
- Young-Sik Lee, Luis Cavazos Quero, **Sang-Hoon Kim**, Jin-Soo Kim, and Seungryoul Maeng, “*ActiveSort: Efficient External Sorting using Active SSDs in the MapReduce Framework*,” Future Generation Computer Systems, Vol. 65, pp. 76–89, December 2016.
- **Sang-Hoon Kim**, Jinkyu Jeong, Jin-Soo Kim, and Seungryoul Maeng, “*SmartLMK: A Memory Reclamation Scheme for Improving User-perceived App Launch Time*,” ACM Transactions on Embedded Computing Systems, Vol. 15, Issue 3, No. 47, June 2016.
- Eunji Pak, **Sang-Hoon Kim**, Jaehyuk Huh, and Seungryoul Maeng, “*Revisiting Shared Cache Contention Problems: A Practical Hardware-Software Cooperative Approach*,” IEICE Transactions on Information and Systems, Vol. E96-D, No. 7, pp. 1457–1466, July 2013.
- Wook Jung, Daewoo Lee, Eunji Pak, Youngjae Lee, **Sang-Hoon Kim**, Jin-Soo Kim, Taewoong Kim, and Sungwon Jun, “*BeanFS: A Distributed File System for Large-scale E-mail Services*,” Journal of Korea Information Science Society, Vol. 36, No. 4, pp. 247–258, August 2009.
- **Sang-Hoon Kim**, Jin-Soo Kim, and Seungryoul Maeng, “*Modeling and Evaluation of Serial Multicast Remote Procedure Calls (RPCs)*,” IEEE Communications Letters, Vol. 13, No. 4, pp.283–285, April 2009.

Others

- Joohyung Park, Kisik Jeong, **Sang-Hoon Kim**, and Jin-Soo Kim, “*DDZTrace: An Online Semantic-aware Block Tracing Tool*,” Poster on the 14th USENIX Conference on File and Storage Technologies (USENIX FAST’16), Santa Clara, CA, USA, February 2016.
- **Sang-Hoon Kim**, Jinho Seol, Seungryoul Maeng, and Jin-Soo Kim, “*Design and Implementation of Full-Disk Encryption Using Hardware Support*,” Poster on the Korea Information Science Society Workshop on Special Interest Group on Computer Systems, No. 30, January 2010.
- Wook Jung, Daewoo Lee, Eunji Pak, Youngjae Lee, **Sang-Hoon Kim**, Jin-Soo Kim, Taewoong Kim, and Sungwon Jun, “*BeanFS: A Distributed File System for a Large*

Number of Immutable Files,” Technical Report CS-TR-2008-289, KAIST Computer Science Department, August 2008.

PATENTS

- Sunae Seo, **Sang-Hoon Kim**, Jin-Soo Kim, and Dongjun Shin, “*Method and Apparatus for Controlling Memory in Electronic Device,*” Patent No. 9588912B2 (March 7, 2017), United States.
- Sunae Seo, **Sang-Hoon Kim**, Jin-Soo Kim, and Dongjun Shin, “*Method and Apparatus for Controlling Memory in Electronic Device,*” Patent Filed No. 10-2015-0108257 (March 17, 2014), Korea.
- Taewoong Kim, Sungwon Jun, Yuncheol Joo, Jin-Soo Kim, Wook Jung, Daewoo Lee, Eunji Pak, Youngjae Lee, **Sang-Hoon Kim**, and Myeongah Yang, “*Distributed File System and Method for Operating File Using Owner-based File Grouping,*” Patent No. 1009149 (January 11, 2011), Korea.
- Taewoong Kim, Sungwon Jun, Yuncheol Joo, Jin-Soo Kim, Wook Jung, Daewoo Lee, Eunji Pak, Youngjae Lee, **Sang-Hoon Kim**, and Myeongah Yang, “*Distributed File System and Method for Replica-based Fault Treatment,*” Patent No. 0994342 (November 12, 2010), Korea.
- Taewoong Kim, Sungwon Jun, Yuncheol Joo, Jin-Soo Kim, Wook Jung, Daewoo Lee, Eunji Pak, Youngjae Lee, **Sang-Hoon Kim**, and Myeongah Yang, “*Distributed File System and File Consistency Management Method Using Replica State Matching,*” Patent No. 0988107 (October 8, 2010), Korea.

PROFESSIONAL SERVICES

Invited Talk

- Popcorn Linux for Distributed Thread Execution, Sungkyunkwan University, South Korea. Oct. 20, 2017
- Popcorn Linux: Compiler, Operating System and Virtualization Support for Application/Thread Migration in Heterogeneous ISA Environments, Linux Plumbers Conference, Los Angeles, CA. Sep. 15, 2017
- The Anatomy of Ceph I/O, Ceph Day Seoul, Seoul, South Korea. Aug. 26, 2016

Reviewer

- ACM Transactions on Storage (2017, 2018)
- Software: Practice and Experience (2017, 2016)
- IEEE Transactions on Computers (2016)

Sub-reviewer

- MSST (2017, 2016)
- IMCOM (2017, 2016)
- LCTES, INFLOW, IC2E (2015)
- EUC, ICDE (2009)

- ACM Transactions on VLSI (2015)
- IEEE Transactions on Computers (2012)

TECHNICAL SKILLS

- Certification of Information Technology (1st grade), Human Resource Development Service of Korea, Aug. 2001

- Linux kernel programming: memory subsystem, file systems, RDMA, device drivers, etc.
- Mobile system programming: Android
- Programming languages: C/C++, Python, bash shell script, Java, PHP, HTML, SQL, etc.
- UNIX-based system maintenance