

Bryan S. Kim

Assistant Professor
Syracuse University
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Research Interests

- Flash and non-volatile memory-based systems
- Data storage systems
- File systems and key-value store

Professional Experience

- Assistant Professor Aug. 2019 – present
Department of Electrical Engineering & Computer Science *Syracuse University*
- Postdoctoral Researcher Mar. 2018 – June 2019
Institute of Computer Technology *Seoul National University*

Education

- Seoul National University
Ph.D. in Computer Science & Engineering Feb. 2018
– Advisor: the late Prof. Sang Lyul Min
– Thesis: An Autonomic SSD Architecture
- Seoul National University
M.S. in Electrical Engineering & Computer Science Aug. 2009
– Advisor: the late Prof. Sang Lyul Min
– Thesis: Efficient Flash Memory Read Request Handling Based on Split Transactions
- University of California, Berkeley
B.S. in Electrical Engineering & Computer Science May 2006

Grants & Awards

- Bryan S. Kim. CNS CORE: SMALL: CPR FOR FLASH-BASED STORAGE SYSTEMS. Funded by *National Science Foundation*, 2020 NSF \$488,277

Publications

- Youil Han, Bryan S. Kim, Jeseong Yeon, Sungjin Lee, and Eunji Lee. TEKSDB: WEAVING DATA STRUCTURES FOR A HIGH-PERFORMANCE KEY-VALUE STORE. In *International Conference on Measurement and Modeling of Computer Systems*, 2019 SIGMETRICS'19 acceptance rate: 17.1%
- Bryan S. Kim, Eunji Lee, Sungjin Lee, and Sang Lyul Min. CPR FOR SSDs. In *ACM SIGOPS Workshop on Hot Topics in Operating Systems*, 2019 HotOS'19 acceptance rate: 24.0%
- Youil Han, Bryan S. Kim, Jeseong Yeon, Sungjin Lee, and Eunji Lee. TEKSDB: WEAVING DATA STRUCTURES FOR A HIGH-PERFORMANCE KEY-VALUE STORE. In *Proceedings of the ACM on Measurement and Analysis of Computing Systems*, 3(1): 8:1–8:23, 2019 POMACS'19

- Bryan S. Kim, Jongmoo Choi, and Sang Lyul Min. DESIGN TRADEOFFS FOR SSD RELIABILITY. In *USENIX Conference on File and Storage Technologies*, 2019: 281–294

FAST'19
acceptance rate:
17.9%
- Bryan S. Kim. THE HUMAN MANUAL. In *ACM Crossroads Student Magazine*, 25(1): 34–37, 2018

XRDS'18
- Geonhee Lee, Hyeon Gyu Lee, Juwon Lee, Bryan S. Kim* and Sang Lyul Min. AN EMPIRICAL STUDY ON NVM-BASED BLOCK I/O CACHES. In *ACM SIGOPS Asia-Pacific Workshop on Systems*, 2018

APSys'18
acceptance rate:
36.0%
- Bryan S. Kim, Hyun Suk Yang, and Sang Lyul Min. AUTOSSD: AN AUTONOMIC SSD ARCHITECTURE. In *USENIX Annual Technical Conference*, 2018: 677–689

ATC'18
acceptance rate:
20.1%
- Bryan S. Kim. UTILITARIAN PERFORMANCE ISOLATION IN SHARED SSDS. In *USENIX Workshop on Hot Topics in Storage and File Systems*, 2018

HotStorage'18
acceptance rate:
36.7%
- Bryan S. Kim, Yonggun Lee, and Sang Lyul Min. FRAMEWORK FOR EFFICIENT AND FLEXIBLE SCHEDULING OF FLASH MEMORY OPERATIONS. In *IEEE Non-Volatile Memory Systems and Applications*, 2017: 1–5

NVMSA'17
acceptance rate:
33.3%
- Bryan S. Kim and Sang Lyul Min. QOS-AWARE FLASH MEMORY CONTROLLER. In *IEEE Real-Time and Embedded Technology and Applications Symposium*, 2017: 51–62

RTAS'17
acceptance rate:
23.7%
- Eyee Hyun Nam, Bryan S. Kim, Hyeonsang Eom, and Sang Lyul Min. OZONE (O3): AN OUT-OF-ORDER FLASH MEMORY CONTROLLER ARCHITECTURE. In *IEEE Transactions on Computers*, 60(5): 653–666, 2011

TC'11
- Bryan S. Kim, Eyee Hyun Nam, Yoon Jae Seong, Hang Jun Min, and Sang Lyul Min. EFFICIENT FLASH MEMORY READ REQUEST HANDLING BASED ON SPLIT TRANSACTIONS. In *International Workshop on Software Support for Portable Storage*, 2009

IWSSPS'09
- Joon Ho Um, Bryan S. Kim, Sung Gab Lee, Eyee Hyun Nam, and Sang Lyul Min. FLASH MEMORY-BASED DEVELOPMENT PLATFORM FOR HOMECARE DEVICES. In *IEEE International Conference on Systems, Man, and Cybernetics*, 2008: 2259–2263

SMC'08
- Jin Hyuk Yoon, Eyee Hyun Nam, Yoon Jae Seong, Hongseok Kim, Bryan S. Kim, Sang Lyul Min, and Yookun Cho. CHAMELEON: A HIGH PERFORMANCE FLASH/FRAM HYBRID SOLID STATE DISK ARCHITECTURE. In *IEEE Computer Architecture Letters*, 7(1): 17–20, 2008

CAL'08

Patents

- Bryan S. Kim and Sang Lyul Min. CONTROL DEVICE FOR DYNAMICALLY ALLOCATING STORAGE SPACE AND DATA STORAGE DEVICE INCLUDING THE CONTROL DEVICE. Korea Patent Application 10-2018-0116646, filed Sep. 2018; U.S. Patent Application 16/284924, filed Feb. 2019

Korea: filed
U.S.: filed

- Bryan S. Kim and Sang Lyul Min. SEMICONDUCTOR DEVICE FOR SCHEDULING TASKS FOR MEMORY DEVICE AND SYSTEM INCLUDING THE SAME. Korea Patent Application 10-2017-0153547, filed Nov. 2017; U.S. Patent 10,635,351, filed Mar. 2018, and issued Apr. 2020; China Patent Application 2018-1-0298334.X, filed Apr. 2018

Korea: filed
 U.S.: granted
 China: filed
- Bryan S. Kim and Eyee Hyun Nam. MEMORY APPARATUS AND CONTROL METHOD THEREOF. Korea Patent 10-1564574, filed Nov. 2013, and issued Oct. 2015

Korea: granted
- Hongseok Kim, Bryan S. Kim, and Eyee Hyun Nam. MEMORY APPARATUS AND CONTROL METHOD THEREOF. Korea Patent 10-1531965, filed Nov. 2013, and issued June 2015

Korea: granted
- Sang Lyul Min, Bryan S. Kim, Jinhyuk Kim, Donggi Lee, Taesung Jung, Byeongse So, Duckhyun Chang. MEMORY DEVICE AND PROGRAM METHOD THEREOF. Korea Patent 10-1544607, filed Oct. 2008, and issued Aug. 2015; U.S. Patent 8,493,782, filed Oct. 2009, and issued July 2013; China Patent 101727983, filed Oct. 2009, and issued June 2016

U.S.: granted
 Korea: granted
 China: granted

Industry Experience

- SK Telecom

Seongnam, South Korea

Manager at Storage Tech. Lab

Apr. 2013 – Sep. 2015
- Oracle Corporation

Santa Clara, USA

Research intern at Solaris kernel team

June 2011 – Sep. 2011
- Samsung Advanced Institute of Technology

Yongin, South Korea

Research intern at Semiconductor lab

July 2010 – Sep. 2010
- n&k Technology Inc.

San Jose, USA

Application engineer

July 2006 – July 2007

Teaching

- CIS700: Storage Systems for Big Data

Syracuse University

Instructor

Spring 2020
- CIS341: Computer Organization & Programming Systems

Syracuse University

Instructor

Spring 2020
- CIS486: Design of Operating Systems

Syracuse University

Guest lecturer

Oct. 2019
- ECS 101: Introduction to Engineering and Computer Science

Syracuse University

Guest lecturer

Oct. 2019
- ECS 691: Fundamentals of Research

Syracuse University

Guest lecturer

Oct. 2019
- CSE791: Storage for Big Data & Cloud Computing

Syracuse University

Instructor

Fall 2019
- 035.001: Introduction to Computer Science

Seoul National University

Instructor (rating: 4.68/5.00)

Spring 2019

- 035.001: Introduction to Computer Science Seoul National University
Instructor (rating: 4.62/5.00) *Spring 2018*
- CSE140: Digital Systems Design University of California, San Diego
Teaching assistant (rating: 4.75/5.00) *Winter 2012*
- CSE240A: Advanced Computer Architecture University of California, San Diego
Teaching assistant (rating: 4.51/5.00) *Fall 2011*

Talks

- CPR for SSDs *May 2019*
ACM Workshop on Hot Topics in Operating Systems
- Towards Performant and Reliable Flash-Based Storages *May 2019*
Technische Universität Dresden
- Taming Performance Variability in SSDs *Apr. 2019*
Soongsil University
- Design Tradeoffs for SSD Reliability *Feb. 2019*
USENIX Conference on File and Storage Technologies
- SSD Reliability Management for Unreliable Flash Memory *Feb. 2019*
Korean Conference on Semiconductors
- Performance Predictability for Flash-Based Storages *Feb. 2019*
Syracuse University, University of Wisconsin–Madison
- Performance Implications for Flash Memory Error Handling *Dec. 2018*
SK Hynix
- AutoSSD: an Autonomic SSD Architecture *July 2018*
USENIX Annual Technical Conference
- Utilitarian Performance Isolation in Shared SSDs *July 2018*
USENIX HotStorage
- The Balancing Act in SSDs *June 2018*
DGIST
- Evaluating the Performance and Reliability of Flash Storages *June 2018*
SK Hynix
- An Autonomic SSD *May 2018*
KIISE SIG on File and Storage Technology
- NVM-based Storage Systems for HPC I/O Nodes *Jan. 2018*
KIISE SIG on Heterogenous Computing and Storage
- DRAM-less Flash Memory Storage Device *Nov. 2017*
SK Hynix
- Efficient and Flexible Flash Memory Operation Scheduling *Aug. 2017*
IEEE Non-Volatile Memory Systems and Applications
- QoS-aware Flash Memory Controller *Apr. 2017*
IEEE Real-Time and Embedded Technology and Applications Symposium

Institutional Services

- Undergraduate academic advising
- CIS doctoral program qualifying exam committee

Academic Services

- IEEE Transactions on Computer-Aided Design (TCAD)
Reviewer 2019, 2020
- Design Automation Conference (DAC)
Technical Program Committee 2019, 2020

Student Mentoring

- Xiangqun Zhang (*Ph.D., Syracuse University*) Aug. 2020 – present
- Omkar Desai (*Ph.D., Syracuse University*) Aug. 2020 – present
- Ziyang Jiao (*Ph.D., Syracuse University*) Aug. 2020 – present
- Minwook Kim (*Ph.D., Seoul National University*) June 2018 – present
- Hyeongyu Lee (*Ph.D., Seoul National University*) Jan. 2018 – present
- Juwon Lee (*M.S., Seoul National University*) Jan. 2018 – Mar. 2020
- Seunggeun Chi (*B.S., Seoul National University*) Jan. 2018 – Dec. 2018
- Geonhee Lee (*M.S., Seoul National University*) Jan. 2018 – July 2018
- Yonggun Lee (*M.S., Seoul National University*) Jan. 2017 – Aug. 2017