Sang-Woo Jun

Assistant Professor
Department of Computer Science
University of California, Irvine
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EDUCATION

Massachusetts Institute of Technology 2013–2018
Ph.D. in Electrical Engineering & Computer Science
- Thesis: Big Data Analytics Made Affordable using Hardware-Accelerated Flash Storage
- Advisor: **Arvind**
- Minor in Biomedical Computing

Massachusetts Institute of Technology 2011–2013
M.S. in Electrical Engineering & Computer Science
- Thesis: Scalable Multi-Access Flash Store for Big Data Analytics
- Advisor: **Arvind**

Seoul National University 2004–2011
B.S. in Computer Science and Engineering
- Thesis: Processor Energy Model Calculation using Heat Equilibrium
- Advisor: **Jihong Kim**

RESEARCH INTERESTS

Hardware Acceleration:
- Application-specific hardware acceleration using FPGA
- Programming system, debugging, and libraries
- Hardware acceleration in the cloud

Flash Storage:
- Out-of-core analytic systems to reduce cost while maintaining performance
- Distributed flash storage with in-storage accelerators
- Operating system support for fast storage

PROFESSIONAL EXPERIENCE

University of California, Irvine, 2018–Present
Department of Computer Science, Irvine, MA
Assistant Professor

Oracle Inc, Big Data Discovery, Cambridge, MA 2016
Summer Intern

EMC, EMC Research Cambridge, Cambridge, MA 2015
DragonFire NVM Card Development

Quanta Computers, Quanta Research Institute, Taoyuan, Taiwan 2014
BlueDBM Custom Flash Storage Development

Nexon Inc, Maple Story development team, Seoul, Korea 2005–2007
Game Server/Client Software Engineer, Client Security Engineer

PUBLICATIONS

[JuWr18] "GraFBoost: Using Accelerated Flash Storage for External Graph Analytics." [1]
Sang-Woo Jun, Andy Wright, Sizhuo Zhang, Shuotao Xu, Arvind,
International Symposium on Computer Architecture (**ISCA**), 2018

[XuLe17] "BlueCache: A Scalable Distributed Flash-based Key-value Store," [2]
Shuotao Xu, Sungjin Lee, **Sang-Woo Jun**, Ming Liu, Jamey Hicks, Arvind,
Very Large Data Bases (**VLDB**), 2017

[JuXu17] "Terabyte Sort on FPGA-Accelerated Flash Storage,"
Sang-Woo Jun, Shuotao Xu, Arvind,
Field-Programmable Custom Computing Machines (**FCCM**), 2017

[JuLi16] "BlueDBM: Distributed Flash Storage for Big Data Analytics,"
Sang-Woo Jun, Ming Liu, Sungjin Lee, Jamey Hicks, John Ankcorn, Myron King, Shuotao Xu, Arvind,
ACM Transactions on Computer Systems (**TOCS**), 2016 (Expanded on JuLi15)

[LeLi16] "Application-Managed Flash,"
Sungjin Lee, Ming Liu, **Sangwoo Jun**, Shuotao Xu, Jihong Kim,
File and Storage Technologies (**FAST**), 2016

[LiJu16] "minFlash: A Minimalistic Clustered Flash Array,"
Ming Liu, **Sang-Woo Jun**, Sungjin Lee, Jamey Hicks, Arvind,
Design, Automation and Test in Europe (**DATE**), 2016

[JuCh15] "Large-scale High-Dimensional Nearest Neighbor Search using Flash Memory with In-Store Processing,"
Sang-Woo Jun, Chanwoo Chung, Arvind,
Reconfigurable Computing and FPGAs (**ReConFig**), 2015

[JuLX15] "A Transport-Layer Network for Distributed FPGA Platforms,"
Sang-Woo Jun, Ming Liu, Shuotao Xu, Arvind,
Field Programmable Logic and Applications (**FPL**), 2015

[JuLi15] "BlueDBM: An Appliance for Big Data Analytics," [3]
Sang-Woo Jun, Ming Liu, Sungjin Lee, Jamey Hicks, John Ankcorn, Myron King, Shuotao Xu, Arvind,
International Symposium on Computer Architecture (**ISCA**), 2015

[JuLi14] "Scalable Multi-Access Flash Store for Big Data Analytics,",
Sang-Woo Jun, Ming Liu, Kermin Fleming, Arvind,
Field-Programmable Gate Arrays (**FPGA**), 2014

[JuFl12] "ZIP-IO: Architecture for Application-Specific Compression of Big Data,"
Sang-Woo Jun, Kermin Fleming, Michael Adler, Joel Emer,
Field Programmable Technology (**FPT**), 2012

TALKS

"From JVM to FPGA: Bridging Abstraction Hierarchy via Optimized Deep Pipelining." 2018
HotCloud

[1] **Media coverage:** MIT News, The Next Platform, etc.
[2] **Media coverage:** MIT News, Inside Science, etc.
[3] **Media coverage:** MIT News, Engadget, Enterprise Tech, The Next Platform, etc.

"GraFBoost: Using Accelerated Flash Storage for External Graph Analytics." 2018
International Symposium on Computer Architecture (**ISCA**)

"Terabyte Sort on FPGA-Accelerated Flash Storage" 2017
Field-Programmable Custom Computing Machines (**FCCM**)

"Large-scale High-Dimensional Nearest Neighbor Search using Flash Memory with In-Store Processing," 2015
Reconfigurable Computing and FPGAs (**ReConFig**)

"BlueDBM: A Multi-access, Distributed Flash Store for Big Data Analytics" 2015
CSAIL Affiliates Program, MIT

"BlueDBM Hardware Details" 2015
Samsung Inc., Seoul, Korea

"BlueDBM: An Appliance for Big Data Analytics" 2015
International Symposium on Computer Architecture (**ISCA**)

"Triple Store on BlueDBM" 2014
Lincoln Laboratory at MIT

"BlueDBM: A Multi-Access, Distributed Flash Store for Big Data Analytics" 2014
EMC Flash Forum, Hopkinton, MA

"Scalable Multi-Access Flash Store for Big Data Analytics" 2014
Field-Programmable Gate Arrays (**FPGA**)

"BlueDBM: Distributed Flash Store for Big Data Analytics" 2013
Xilinx Inc., San Jose, CA

"ZIP-IO: Architecture for Application-Specific Compression of Big Data" 2012
Field Programmable Technology (**FPT**)

TEACHING EXPERIENCE

Teaching Assistant Fall 2012
6.s195 Computer Architecture Laboratory (Now 6.175)
Department of Electrical Engineering and Computer Science, MIT, Cambridge, USA

- One of two TAs developing in-class activities and programming lab assignments.
- Weekly recitations, special lectures and mentored 18 students for final projects.
- Graded student programming assignments.

SCHOLARSHIPS AND GRANTS

MIT-Spain La Caxia Foundation 2017
Travel grant for collaboration with Barcelona Supercomputing Center

Kwanjeong Educational Foundation Scholarship 2011–2016
Tuition, Kwanjeong Educational Foundation, Korea

TOEFL Scholarship 2010
ETS (Educational Testing Service), USA

National Scholarship for Science and Engineering 2004–2010
Full Tuition, Aid Foundation, Korean Government

SKILLSET

FPGA Accelerator Development: Bluespec, Verilog expertise

System Software Development: Device driver, File system

Scalable Analytics Platforms: Hadoop, Spark, GraphLab, Accumulo

Programming Languages: C, C++, Java, Python, Javascript, PHP, etc