JI-YONG SHIN

Postdoctoral Associate

Yale University · Department of Computer Science · P.O. Box 208285 · New Haven, CT 06520-8285

Email: jiyong.shin@yale.edu · Homepage: `http://www.jiyongshin.info`

EDUCATION

Ph.D. in Computer Science Aug 2010 - Jan 2017

Cornell University, Ithaca, NY, U.S.A.
Research topics: cloud storage systems and datacenter networks.
Advisor: Prof. Hakim Weatherspoon.

M.S. in Computer Science Feb 2007 - Aug 2009

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea.
Research topic: NAND flash-based solid state drives (SSD).
Advisor: Prof. Seungryoul Maeng.

B.S. in Computer Science and Industrial Engineering Mar 2000 - Feb 2007

Yonsei University, Seoul, South Korea.
Minor: Electrical and Electronic Engineering.
Mandatory military service (South Korea Army) from 2002 to 2004.

EXPERIENCE

Yale University, New Haven, CT Sep 2016 - Present

Postdoctoral Associate, Department of Computer Science.
Research topics: distributed systems and software verification.
Advisors: Prof. Mahesh Balakrishnan and Prof. Zhong Shao.

Google, Mountain View, CA May 2015 - Aug 2015

Intern, Technical Infrastructure Team.
Project: Google Cloud Dataflow.

Microsoft Research Silicon Valley Center, Mountain View, CA May 2011 - Aug 2011

Intern, Systems Group.
Project: building an interactive multi-user mobile application framework.

IBM T.J. Watson Research, Hawthorne, NY Feb 2010 - May 2010

Graduate-Level Co-Op, Dynamic Optimization Group.
Project: designing and implementing an accurate SSD simulator.

Microsoft Research, Redmond, WA Sep 2009 - Nov 2009

Intern, Machine Learning and Applied Statistics Group.
Projects: designing completely wireless datacenters and anti-counterfeit optical media.

Microsoft Research Asia, Beijing, China Sep 2008 - Feb 2009

Intern, Platforms and Devices Center.
Project: designing flash translation layers for high-performance reconfigurable SSDs for servers.

TEACHING

Yale University

- Guest lecture on storage systems, Operating Systems (CS422/522). Fall 2017
- Guest lecture on consensus protocols, Advanced Distributed Systems (CPSC625). Spring 2017

Cornell University

- Teaching assistant, Advanced Systems (CS6410). Fall 2011
- Teaching assistant, Introduction to Computing Using Matlab (CS1112). Spring 2011
- Teaching assistant, Introduction to Computing Using Matlab (CS1112). Fall 2010

Korea Advanced Institute of Science and Technology (KAIST)

- Teaching assistant, Design and Analysis of Algorithms (CS500). Spring 2008
- Teaching assistant, Embedded Systems (CS310). Fall 2007

SERVICE

Program Committee

- ACM Symposium on Cloud Computing (ACM SoCC), 2018, 2017
- USENIX Annual Technical Conference (USENIX ATC), 2017.
- International Workshop on Accelerating Data Management Systems Using Modern Processor and Storage Architectures (ADMS), 2013, 2012, 2011.

Organizing Committee

- Registration Chair, ACM Symposium on Cloud Computing (ACM SoCC) 2017.

Journal Reviewer

- IEEE Transactions on Computers, 2018.
- IEEE Transactions on Parallel and Distributed Systems, 2016.
- ACM Transactions on Storage, 2016.

External Reviewer

- SOSP 2015; NSDI 2015, 2012; OSDI 2014; FAST 2014; SoCC 2014, 2012; EuroSys 2013, 2012; SIGCOMM 2012.

HONORS AND AWARDS

- Conference travel grants (FAST 2016, 2013; SOSP 2015, 2013)
- Best paper award, ACM/IEEE ANCS, 2012.
- 2nd place, student poster presentation, EMC University Day, 2012.
- Outstanding teaching assistant award, KAIST, 2008.
- KAIST fellowship, Korean government, 2007 - 2009.
- High honors student, Yonsei Univ. Fall, 2005.
- Honors student, Yonsei Univ. Spring, 2005.
- U.S. Army Commendation Medal, U.S. Army, 2004.
- U.S. Army Achievement Medal, U.S. Army, 2003.

RESEARCH INTERESTS

Distributed systems.
File and storage systems.
Operating systems.
Network systems.
System verification.
Cloud computing and cloud storage systems.
Datacenter networks.

PUBLICATIONS

Working Papers

1. "Compositional Witness-Based Verification Templates for Leader-Based Distributed Systems," Jieung Kim, Wolf Honore, **Ji-Yong Shin**, Lucas Paul, and Zhong Shao, under a conference submission[1], 2018.

2. "Write-Once Registers: A Modular Foundation for Simple, Verifiable Distributed Systems," **Ji-Yong Shin**, Jieung Kim, Wolf Honore, Hernan Vanzetto, Srihari Radhakrishnan, Mahesh Balakrishnan, and Zhong Shao, Technical Report YALEU/DCS/TR1544, 2018.

Refereed Papers

1. "Isotope: ACID Transactions for Block Storage," **Ji-Yong Shin**, Mahesh Balakrishnan, Tudor Marian, and Hakim Weatherspoon, in ACM Transactions on Storage (TOS), Vol. 13, Issue 1, pp 4:1-4:25, Feb 2017.

2. "Towards Weakly Consistent Local Storage Systems," **Ji-Yong Shin**, Mahesh Balakrishnan, Tudor Marian, Jakub Szefer and Hakim Weatherspoon, Proceedings of the ACM Symposium on Cloud Computing (SoCC), Santa Clara, CA, USA, Oct 2016.

3. "Isotope: Transactional Isolation for Block Storage," **Ji-Yong Shin**, Mahesh Balakrishnan, Tudor Marian, and Hakim Weatherspoon, Proceedings of the USENIX Conference on File and Storage Technologies (FAST), Santa Clara, CA, USA, Feb 2016.

4. "On the Feasibility of Completely Wireless Data Center," **Ji-Yong Shin**, Emin Gün Sirer, Hakim Weatherspoon, and Darko Kirovski, in IEEE/ACM Transactions on Networking (ToN), Vol. 21, No. 5, pp 1666-1679, Oct 2013.

5. "Gecko: Contention-Oblivious Disk Arrays for Cloud Storage," **Ji-Yong Shin**, Mahesh Balakrishnan, Tudor Marian, and Hakim Weatherspoon, Proceedings of the USENIX Conference on File and Storage Technologies (FAST), San Jose, CA, USA, Feb 2013.

6. "On the Feasibility of Completely Wireless Data Center," **Ji-Yong Shin**, Emin Gün Sirer, Hakim Weatherspoon, and Darko Kirovski, Proceedings of the ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS), Austin, TX, USA, Oct 2012. (**Awarded Best Paper**)

7. "Gecko: A Contention-Oblivious Design for Cloud Storage," **Ji-Yong Shin**, Mahesh Balakrishnan, Lakshmi Ganesh, Tudor Marian, and Hakim Weatherspoon, Proceedings of the USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage), Boston, MA, USA, Jun 2012.

8. "Small World Datacenters," **Ji-Yong Shin**, Bernard Wong, and Emin Gün Sirer, Proceedings of the ACM Symposium on Cloud Computing (SoCC), Cascais, Portugal, Oct 2011.

9. "Exploiting Internal Parallelism of Flash-based SSDs," Seon-Yeong Park, Euiseong Seo, **Ji-Yong Shin**, Seungryoul Maeng, and Joonwon Lee, IEEE Computer Architecture Letters (CAL), Vol. 9, Issue. 1, pp. 9-12, 2010.

[1]The title has been modified in this CV for blind reviews.

10. "A Parallel Motion Estimation Engine for H.264 Encoding Using the UMHexagonS Algorithm," **Ji-Yong Shin**, Jung-Wook Park, In-Jik Lee, Shin-Dug Kim, and Charles Weems, Proceedings of the International Conference on Convergence and Hybrid Information Technology (ICHIT), pp. 53-59, Daejeon, Korea, Aug 2009.
11. "FTL Design Exploration in Reconfigurable High-Performance SSD for Server Applications," **Ji-Yong Shin**, Zeng-Lin Xia, Ning-Yi Xu, Gui Gao, Xiong-Fei Cai, Seungryoul Maeng, and Feng-Hsiung Hsu, Proceedings of the International Conference on Supercomputing (ICS), pp. 338-349, Yorktown Heights, NY, USA, Jun 2009.
12. "Hardware Module for Real-time Integer Pel Motion Estimation of H.264," **Ji-Yong Shin**, Injik Lee, and Shin-Dug Kim, Proceedings of the Regular Spring Conference of Korea Information Processing Society (extended abstract), Sungnam, Korea, May 2007.

Technical Reports

1. "On the Feasibility of Completely Wireless Data Center," **Ji-Yong Shin**, Emin Gün Sirer, Hakim Weatherspoon, and Darko Kirovski, Cornell Technical Report, URI: http://hdl.handle.net/1813/22846, 2011.

Patents

1. "Data Center Using Wireless Communication," **Ji-Yong Shin**, Darko Kirovski, and David T. Harper III, US Patent No. US9,391,716. Jul 2016.
2. "Optical Medium with Added Descriptor to Reduce Counterfeiting," Darko Kirovski, **Ji-Yong Shin**, and Vanessa Testoni, US Patent Application, Publication No. 20100214894, Aug 2010.

Thesis and Dissertation

1. "Isolation in Cloud Storage," **Ji-Yong Shin**, Ph.D. Dissertation, Department of Computer Science, Cornell University, 2017.
2. "Scheduling Flash Requests in SSD to Improve Response Time," **Ji-Yong Shin**, Master's Thesis, Division of Computer Science, School of Electrical Engineering and Computer Science, Korea Advanced Institute of Science and Technology, 2009.

TALKS

Towards Weakly Consistent Local Storage Systems

- ACM Symposium on Cloud Computing (SoCC), Santa Clara, CA. Oct 2016

Isotope: Transactional Isolation for Block Storage

- Yale University, New Haven, CT. Mar 2016
- USENIX Conference on File and Storage Technologies (FAST), Santa Clara, CA. Feb 2016

Gecko: Contention-Oblivious Disk Arrays for Cloud Storage

- Industry-Academia Partnership Cloud Workshop (poster), Ithaca, NY. Oct 2013
- Western Digital Corporation, Irvine, CA. May 2013
- USENIX Conference on File and Storage Technologies (FAST), San Jose, CA. Feb 2013

On the Feasibility of Completely Wireless Datacenters

- Team for Research in Ubiquitous Security Technology (TRUST) Autumn Conference, Washington, D.C. Nov 2012

- ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS), Austin, TX. Oct 2012

Gecko: A Contention-Oblivious Design for Cloud Storage

- USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage), Boston, MA. Jun 2012
- EMC University Day (poster), Boston, MA. Jun 2012

Small-World Datacenters

- ACM Symposium on Cloud Computing (SoCC), Cascais, Portugal. Oct 2011

Flash Translation Layer (FTL) Design Exploration in Reconfigurable High-Performance SSD for Server Applications

- International Conference on Supercomputing (ICS), Yorktown Heights, NY. Jun 2009