

Yiying Zhang

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ACADEMIC EXPERIENCE

Postdoctoral Scholar University of California, San Diego September 2013 - 2015
Advisor: Prof. Steven Swanson

Ph.D. in Computer Science University of Wisconsin - Madison August 2013
Advisors: Prof. Remzi H. Arpaci-Dusseau and Prof. Andrea C. Arpaci-Dusseau
Dissertation: De-indirection for Flash-based Solid State Drives

M.S. in Computer Engineering University of Florida December 2006

B.S. in Computer Science Fudan University June 2005

APPOINTMENTS

Purdue University, Assistant Professor 2015-
University of California, San Diego, Postdoctoral Scholar 2013-2015
University of Wisconsin-Madison, Research Assistant 2007-2013
University of Florida, Research Assistant 2005-2006

AWARDS

OSDI '18 Best Paper Award, 2018

CONFERENCE AND JOURNAL PUBLICATIONS

Tengfei Tu, Xiaoyu Liu, Linhai Song, **Yiying Zhang**, "Understanding Real-World Concurrency Bugs in Go," *the 24th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'19)* (Acceptance Rate: 21%)

Yizhou Shan, Yutong Huang, Yilun Chen, **Yiying Zhang**, "LegoOS: a Disseminated, Distributed OS for Hardware Resource Disaggregation," *the 13th USENIX Symposium on Operating Systems Design and Implementation (OSDI '18 best paper)* (Acceptance Rate: 18%)

Shin-Yeh Tsai, **Yiying Zhang**, "LITE Kernel RDMA Support for Datacenter Applications," *Proceedings of the 26th ACM Symposium on Operating Systems Principles (SOSP '17)* (Acceptance Rate: 17%)

Yizhou Shan, Shin-Yeh Tsai, **Yiying Zhang**, "Distributed Shared Persistent Memory," *Proceedings of the ACM Symposium on Cloud Computing 2017 (SoCC '17)* (Acceptance Rate: 23%)

Yiying Zhang, Jian Yang, Amirsaman Memaripour, Steven Swanson, "Mojim: A Reliable and Highly-Available Non-Volatile Memory System," *Proceedings of the 20th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '15)* (Acceptance Rate: 17%)

Yiying Zhang, Steven Swanson, "A Study of Application Performance with Non-Volatile Main Memory," *Proceedings of the 31st IEEE Conference on Massive Data Storage (MSST '15)* (Acceptance Rate: 30%)

Yiying Zhang, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, “Removing the Costs and Retaining the Benefits of Flash-Based SSD Virtualization with FSDV,” *Proceedings of the 31st IEEE Conference on Massive Data Storage (MSST '15)* (Acceptance Rate: 30%)

Yiying Zhang, Gokul Soundararajan, Mark W. Storer, Lakshmi N. Bairavasundaram, Sethuraman Subbiah, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, “Warming up Storage-Level Caches with Bonfire,” *Proceedings of the 11th Conference on File and Storage Technologies (FAST '13)* (Acceptance Rate: 19%)

Mohit Saxena, **Yiying Zhang**, Michael M. Swift, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, “Getting Real: Lessons in Transitioning Research Simulations into Hardware Systems,” *Proceedings of the 11th Conference on File and Storage Technologies (FAST '13)* (Acceptance Rate: 19%)

Yiying Zhang, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, “Warped Mirrors for Flash,” *Proceedings of the 29th IEEE Conference on Massive Data Storage (MSST '13)* (Acceptance Rate: 13%)

Yiying Zhang, Leo Prasath Arulraj, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, “De-indirection for Flash-based SSDs with Nameless Writes,” *Proceedings of the 10th Conference on File and Storage Technologies (FAST '12)* (Acceptance Rate: 19%)

Mohit Saxena, Michael M. Swift, **Yiying Zhang**, “FlashTier: a Lightweight, Consistent and Reliable Storage Cache,” *Proceedings of the 7th European Conference on Computer Systems (EuroSys '12)* (Acceptance Rate: 15%)

Hyeoncheol Kim, **Yiying Zhang**, Yong-Seok Heo, Heung-Bum Oh, Su-Shing Chen, “Specificity Rule Discovery in HIV-1 Protease Cleavage Site Analysis,” *Computational Biology and Chemistry 32(1): 72-79 (2008)* (Impact Factor: 1.37)

Hyeoncheol Kim, Tae-Sun Yoon, **Yiying Zhang**, Anupam Dikshit, Su-Shing Chen, “Predictability of Rules in HIV-1 Protease Cleavage Site Analysis,” *Proceedings of the 2006 International Conference on Computational Science (ICCS '06)* (Acceptance Rate: 35%)

WORKSHOPS

Yizhou Shan, **Yiying Zhang**, “Disaggregating Memory with Software-Managed Virtual Cache,” *the 2018 Workshop on Warehouse-scale Memory Systems (WAMS '18)* (co-located with ASPLOS '18),

Shin-Yeh Tsai, **Yiying Zhang**, “MemAlbum: an Object-Based Remote Software Transactional Memory System,” *the 2018 Workshop on Warehouse-scale Memory Systems (WAMS '18)* (co-located with ASPLOS '18),

Yilun Chen, **Yiying Zhang**, “Split Container: Running Containers beyond Physical Machine Boundaries,” *the 2018 Workshop on Warehouse-scale Memory Systems (WAMS '18)* (co-located with ASPLOS '18),

Yizhou Shan, Shin-Yeh Tsai, **Yiying Zhang**, “Distributed Shared Persistent Memory,” *the 9th Annual Non-Volatile Memories Workshop (NVMW '18)*

Yiying Zhang, Yizhou Shan, Sumukh Hallymysore, “Disaggregated Operating System,” *17th International Workshop on High Performance Transaction Systems (HPTS '17)*

Linhai Song, Heqing Huang, Wu Zhou, Wenfei Wu, **Yiying Zhang**, “Learning from Big Malwares,” *Proceedings of the 6th ACM Asia-Pacific Workshop on Systems (APSys '16)*

POSTERS AND TECHNICAL REPORTS

Tengfei Tu, Xiaoyu Liu, Linhai Song, **Yiying Zhang**, “Understanding Real-World Concurrency Bugs in Go,” *Poster at the 13th USENIX Symposium on Operating Systems Design and Implementation (OSDI '18)*

Yizhou Shan, Yutong Huang, Yilun Chen, **Yiying Zhang**, “Disaggregated Operating System” *Poster at the 26th ACM Symposium on Operating Systems Principles (SOSP '17)*

Yizhou Shan, Sumukh Hallymysore, Yutong Huang, Yilun Chen, **Yiying Zhang**, “Disaggregated Operating System” *Poster at the ACM Symposium on Cloud Computing 2017 (SoCC '17)*

Shin-Yeh Tsai, Linzhe Li, **Yiying Zhang**, “Rockies: A Network System for Future Data Center Racks” *WIP and Poster at the 14th USENIX Conference on File and Storage Technologies (FAST '16)*

Yiying Zhang, Jian Yang, Amirsaman Memaripour, Steven Swanson, “Mojim: A Reliable and Highly-Available Non-Volatile Memory System,” *Poster at the 11th USENIX Symposium on Operating Systems Design and Implementation (OSDI '14)*

Yiying Zhang, Vijayan Prabhakaran, “Duplication Aware Disk Array,” *Microsoft Technical Report (MSR-TR-2012-127)*

Yiying Zhang, Vijayan Prabhakaran, “DADA: Duplication Aware Disk Array,” *Poster at the 9th Conference on File and Storage Technologies (FAST '11)*

Yiying Zhang, Leo Prasath Arulraj, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, “Porting File System Structures to Nameless Writes,” *Poster at the 9th USENIX Symposium on Operating Systems Design and Implementation (OSDI '10)*

PATENTS

“Duplicate-Aware Disk Arrays,” Vijayan Prabhakaran, Yiying Zhang, US Patent US8631272B2

“System and Method for an Efficient Cache Warm-up,” Lakshmi N. Bairavasundaram, Gokul Soundararajan, Mark W. Storer, Yiying Zhang, US Patent WO2014100253 A1

RESEARCH GRANTS AND DONATIONS RECEIVED

Principal Investigator, NSF 1719215, CSR: Small: Distributed Shared Persistent Memory, \$404,572, 10/01/2017 - 09/30/2020.

Principal Investigator, Mellanox Co. Ltd., Hardware donation of 26 Connect-X4 network adapters and one MSB7800-ES2F Infiniband switch.

Principal Investigator, Samsung Co. Ltd., Hardware donation of 22 PM953 SSDs and two PM1725s (high-end) SSDs.

Principal Investigator, Purdue FY1617 PRF Research Grant, \$29,130.

INDUSTRY EXPERIENCE

Research Intern, **NetApp Advanced Technology Group** Sunnyvale, CA, Summer 2012
Mentors: Dr. Gokul Soundararajan and Dr. Mark W. Storer

Research Intern, **Microsoft Research** Mountain View, CA, Summer 2010
Mentor: Dr. Vijayan Prabhakaran

Software Engineer Intern, **Microsoft**, Business Intelligence Group Shanghai, China, Summer 2008

Software Design Engineer, **Optym** Gainesville, FL, January - August 2007

MENTORING AND ADVISING EXPERIENCE

Ph.D. students at Purdue: Shin-Yeh Tsai, Yizhou Shan, Yilun Chen

Visiting scholar at Purdue: Ke Liu

Visiting undergraduate student at Purdue: Yongzhou Chen

Master students at Purdue: Yutong Huang, Xiaoyu Liu

Undergraduate students at Purdue: Junjie Wang

Master's completed at Purdue: Sumukh Hallymysore (08/2017), Linzhe Li (12/2016), Nan Xiang (05/2016), Tim Wingender (exchange student from 08/2015 to 05/2016)

Ph.D. students at UCSD: Jian Yang, Amirsaman Memaripour, Jian Xu, Meenakshi Sundaram Bhaskaran

Visiting students and scholar at UCSD: Jiaxin Ou (Tsinghua), Matias Bjorling (IT University of Copenhagen), Kosuke Suzuki (Fujitsu)

Master student at UCSD: Pavan Kumar Pavagada Nagaraja

TEACHING

ECE695 Modern Datacenter Systems (Fall 2016, Fall 2017, Fall 2018)

ECE469 Operating Systems Engineering (Spring 2016, Spring 2017, Spring 2018)

ECE565 Computer Architecture (Fall 2015)

SERVICES AND OTHER ACTIVITIES**Program Committee:**

2019: SOSP '19, HotOS '19

2018: OSDI '18, USENIX ATC '18, SoCC '18, FAST '19, ASPLOS '19

2017: ASPLOS '18, SoCC 2017, HotStorage '17

2016: ASPLOS '17 (external), Micro '16 (external)

2015: FAST '16, SoCC '15, MSST '15, Micro '15 (external)

2014: HotStorage '14, IEEE Cluster '14

Journal Review:

ACM Transactions on Storage (TOS): 2017, 2014, 2013

ACM Transactions on Embedded Computing Systems (TECS): 2016

ACM Transactions on Computer Systems (TOCS):2014

IEEE Transactions on Computers (TOC): 2014, 2012

IEEE Transactions on VLSI Systems (TVLSI): 2014

IEEE Transactions on Parallel and Distributed Systems (TPDS): 2014

Diversity Activities:

Attended Diversity Workshop (2017, 2010, 2009) and led panel discussions in 2017 the Grace Hopper Celebration of Women in Computing Conference (2014)

TALKS

“Farewell to Servers: Hardware, Software, and Network Approaches towards Datacenter Resource Disaggregation”, UT Austin, Austin, TX, NOV 2018

“Farewell to Servers: Hardware, Software, and Network Approaches towards Datacenter Resource Disaggregation”, Stanford, Palo Alto, CA, Oct 2018

“Farewell to Servers: Hardware, Software, and Network Approaches towards Datacenter Resource Disaggregation”, UC Berkeley, Berkeley, CA, Oct 2018

“Farewell to Servers: Hardware, Software, and Network Approaches towards Datacenter Resource Disaggregation”, USC, Los Angeles, CA, Oct 2018

“Farewell to Servers: Hardware, Software, and Network Approaches towards Datacenter Resource Disaggregation”, SJTU, Shanghai, China, Sep 2018

“Farewell to Servers: Hardware, Software, and Network Approaches towards Datacenter Resource Disaggregation”, IBM Watson, Yorktown Heights, NY, Aug 2018

“Farewell to Servers: Hardware, Software, and Network Approaches towards Datacenter Resource

Disaggregation”, Samsung Research, Mountain View, CA, Aug 2018

“Distributed Shared Persistent Memory”, NVMW Workshop, La Jolla, CA, Mar 2018

“Farewell to Servers: Hardware, Software, and Network Approaches towards Datacenter Resource Disaggregation”, BPOE Workshop (co-located with ASPLOS’18), Williamsburg, VA, Mar 2018

“Mitsume: an Object-Based Remote Memory System”, WAMS Workshop (co-located with ASPLOS’18), Williamsburg, VA, Mar 2018

“Split Container: Running Containers beyond Physical Machine Boundaries”, WAMS Workshop (co-located with ASPLOS’18), Williamsburg, VA, Mar 2018

“Disaggregating Memory with Software-Managed Virtual Cache”, WAMS Workshop (co-located with ASPLOS’18), Williamsburg, VA, Mar 2018

“Remote and Distributed Memory in the Age of Modern Datacenters”, Databricks, San Francisco, CA, Dec 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, Yale, New Haven, CT, Dec 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, Columbia, New York, NY, Dec 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, UC-Irvine, Irvine, CA, Nov 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, UC-Davis, Davis, CA, Nov 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, Amazon, East Palo Alto, CA, Oct 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, NetApp, Sunnyvale, CA, Oct 2017

“Disaggregated Operating System”, HPTS ’17, Pacific Grove, CA, Oct 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, VMware Research, Palo Alto, CA, July 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, UCSB, Santa Barbara, CA, July 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, USC, Los Angeles, CA, July 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, Tsinghua University, Beijing, China, May 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, Chinese Academy of Science, Beijing, China, May 2017

“Remote and Distributed Memory in the Age of Modern Datacenters”, SJTU, Shanghai, China, May 2017

“Towards Future Data Center Racks”, Samsung, San Jose, CA, Feb 2016

“Rethinking Storage Vertically”, HP, Palo Alto, CA, June 2015

“Rethinking Storage Vertically”, NetApp, Sunnyvale, CA, June 2015

“Rethinking Storage Vertically”, EMC, Santa Clara, CA, June 2015

“Rethinking Storage Vertically”, Samsung, Milpitas, CA, June 2015

“A Study of Application Performance with Non-Volatile Main Memory”, MSST ’15, Santa Clara, CA, June 2015

“Removing the Costs and Retaining the Benefits of Flash-Based SSD Virtualization with FSDV”, MSST ’15, Santa Clara, CA, June 2015

“System Design for Emerging Storage Technologies”, Microsoft Research Asia, Beijing, China, Dec 2014

“System Design for Emerging Storage Technologies”, Tsinghua University, Beijing, China, Dec 2014

“System Design for Emerging Storage Technologies”, Chinese Academy of Sciences, Beijing, China, Dec 2014

“Replicating Non-Volatile Main Memory”, Center for Magnetic Recording Research, UCSD, San Diego, CA, Oct 2014

“Replicating Non-Volatile Main Memory”, Center for Networked Systems, UCSD, San Diego, CA, Oct 2014

“Lock-Free, Resilient Data Structures for Fast I/O Accesses”, Center for Networked Systems, UCSD, San Diego, CA, Oct 2014

“Non-Volatile Main Memory Systems”, Intel, Hillsboro, PO, May 2014

“Virtualization and Non-Volatile Main Memory”, Center for Magnetic Recording Research, UCSD,

San Diego, CA, May 2014

“Virtualization and Non-Volatile Main Memory”, Center for Networked Systems, UCSD, San Diego, CA, May 2014

“A Reliable and Highly-Available Non-Volatile Memory System”, University of Chicago, Chicago, IL, May 2014

“A Reliable and Highly-Available Non-Volatile Memory System”, University of Wisconsin-Madison, Madison, WI, May 2014

“De-indirection in Computer Systems”, HPTS '13, Pacific Grove, CA, Sept 2013

“De-virtualization in Storage Systems”, UCSD, San Diego, CA, May 2013

“De-virtualization in Storage Systems”, Microsoft Research, Redmond, WA, April 2013

“Warped Mirrors for Flash”, MSST '13, Long Beach, CA, May 2013

“Warming up Storage-Level Caches with Bonfire”, FAST '13, San Jose, CA, Feb. 2013

“De-virtualization for Flash-based SSDs”, WISDoM Workshop, Madison, WI, Nov. 2012

“Warming up Storage-level Caches with Bonfire”, NetApp, Sunnyvale, CA, Aug. 2012

“De-indirection for Flash-based SSDs with Nameless Writes”, Google, Madison, WI, Mar. 2012

“De-indirection for Flash-based SSDs with Nameless Writes”, Microsoft Research, Mountain View, CA, Feb. 2012

“De-indirection for Flash-based SSDs with Nameless Writes”, FAST '12, San Jose, CA, Feb. 2012

“Duplicate-aware Disk Arrays”, Microsoft Research, Mountain View, CA, Aug. 2010

REFERENCES

Available upon request