Yizheng Jiao

704 Martin Luther King Jr. Blvd Apt D8, Chapel Hill, N.C. 27514
Phone: +1 (919) 914-1794 **Email:** yizheng@cs.unc.edu
Github: jyizheng

RESEARCH INTERESTS

My research interests focus on the design and implementation of efficient and secure data management system. I am doing research on write-optimized index data structures for high-speed storage system. In my research projects, I am developing a general-purpose in-kernel file system on Linux which has compelling performance on micro-write intensive workloads. I am also exploring the potentials of write-optimzed data strutures in designing secure persistent key-value stores with the aid of SGX/TrustZone to protect user's data against malicious Operating System.

EDUCATION EXPERIENCE

Ph.D in Computer Science Aug. 2016 - Present
University of North Carolina at Chapel Hill
Advisor: Donald Porter Expected graduation date: Aug. 2021

M.S. in Computer Science Jan. 2014 - Aug. 2016
Stony Brook University
Advisor: Donald Porter

M.S. in Electrical and Computer Engineering Sep. 2009 - March. 2012
Huazhong University of Science & Technology
Advisor: Feng Bin, Wenyu Liu

B.S. in Electrical and Computer Engineering Sep. 2005 - Jun. 2009
Chongqing University

PROFESSIONAL EXPERIENCE

Research Intern May 2018 - Aug. 2018
Advanced Technology Group, NetApp Inc, Durham, N.C.
Mentor: Michael Condict, Xiongzi Ge

- Optimization of *BetrFS* for SSD device;
- Integration of in-kernel B^{ϵ}-tree key-value store with Linux page cache to reduce overhead of data transport;
- Extended BetrFS to support large block size to reduce meta-data overhead;
- Sequential write performance is increased by 2 times.

Software Engineer Intern May 2017 - Aug. 2017
vSan Team, VMWare Inc, Palo Alto, C.A.
Mentor: Wenguang Wang, Ding Li

- Optimization of Copy-on-Write $B-tree$ with write-optimized techniques;
- Analysis of snapshot service performance for Virtual Distributed File System (VDFS);
- Implementation of physical block cache for VDFS;
- Read performance is improved by 50%.

Software Engineer May 2013 - Aug. 2013
Leadership Computing Facility Group, Oak Ridge National Lab, Knoxville, T.N.
Mentor: Sarp Oral

- Implementation of parallel and scalable programs to move and archive large volumes of data on supercomputers;
- Analysis on performance of implemented utilities on Titan supercomputer with hundreds of MPI nodes.

RESEARCH PROJECTS

BetrFS Project Jan. 2014 - Present

Details could be found at **http://www.betrfs.org**

- Profing and analyzing BetrFS performance on SSD device;
- Optimizing BetrFS's metadata performance with varied block size;
- Integrating in-kernel B^{ϵ}-tree key-value store with Linux page cache;
- Implementing Copy-on-Write page cache to support file system transaction.

Exploring Contiguity in Memory System May 2014 - May 2015

- Studying physical page allocator of popular operating systems, such as Linux, Windows, OpenBSD and Solaris OS;
- Studying disk block allocator of file systems , such as Ext4, ZFS;
- Evaluating performance impact of Linux Transparent Hugepages for application with big memory footprint, such as graph proccessing, k-mer counting for Genome sequences.

Efficient Data Management for MapReduce Programs May 2013 - Dec 2013

- Enabling memory sharing between map/reduce tasks on the same compute node;
- Accelerating merge phase of MapReduce programs by decoupling values from the K-V pairs during sorting;
- Testing performance of MapReduce programs on Amazon EC2 cluster.

Hybrid Memory System for GPU Aug. 2012 - May 2013

- Hybridizing phrase-change memory and DRAM for GPU global memory;
- Implementing compiler-directed initial data placement for CUDA programs;
- Integrating GPGPU-Sim with DRAMSim2 to simulate GPU global memory system;
- Implementing simulator code to perform hardware-based page migration between PCM and DRAM.

PUBLICATIONS

[**Arxiv**]: **Yizheng Jiao**. ***Exploring Physical Contiguity in Memory System.***

[**Submitted to FAST′2021**]:**Yizheng Jiao**, Simon Bertron, Nirjhar Mukherjee, Rory Bennett, Michael A. Bender, Alex Conway, Martin Farach-Colton William Jannen, Rob Johnson, Donald E. Porter, and Jun Yuan. ***FestiFS: A General-Purpose File System for Commodity SSDs and HDDs.***

[**FAST′20**]:Yang Zhan, Alex Conway, **Yizheng Jiao**, Nirjhar Mukherjee, Ian Groombridge, Michael A. Bender, Martin Farach-Colton William Jannen, Rob Johnson, Donald E. Porter, and Jun Yuan. ***How to Copy Files.***

[**ICPR′19**]:Wenhui Zhang, **Yizheng Jiao**, Dazhong Wu, Srivatsa Srinivasa, Asmit De, Swaroop Ghosh, Peng Liu. ***ArmorPLC: Cyber Security Threats Detection through Ladder Logic Validation for PLCs.***

[**HotStorage′19**]: Alex Conway, Eric Knorr, **Yizheng Jiao**, Michael A. Bender, William Jannen, Rob Johnson, Donald Porter, Martin Farach-Colton. ***Filesystem Aging: Its more Usage than Fullness.***

[**SPAA′19**]:Michael A. Bender, Alexander Conway, Martin Farach-Colton, William Jannen, **Yizheng Jiao**, Rob Johnson, Eric Knorr, Sara McAllister, Nirjhar Mukherjee, Prashant Pandey, Donald E. Porter, Jun Yuan and Yang Zhan. ***Small Refinements to the DAM Can Have Big Consequences for Data-Structure Design***.

[**FAST′18**]:Yang Zhan, Alex Conway, **Yizheng Jiao**, Eric Knorr, Michael A. Bender, Martin Farach-Colton, William Jannen, Rob Johnson, Donald E. Porter, Jun Yuan. ***The Full Path of Full-Path Indexing***. Oakland, USA. Feb, 2018.

[**FAST′17**]:Alex Conway, Ainesh Bakshi, **Yizheng Jiao**, Yang Zhan, Michael A. Bender, William Jannen, Bradley C. Kuszmaul, Donald Porter, Jun Yuan, Martin Farach-Colton. ***File System Fated for Senescence? Nonsense, Says Science!***. Santa Clara, USA. Feb, 2017.

[**SOSP′15**]:Chia-Che Tsai, Yang Zhan, Jayashree Reddy, **Yizheng Jiao**, Tao Zhang, Donald E. Porter. ***How to Get More Value From Your File System Directory Cache***. Monterey, USA. Jan, 2015.

[**FAST′15**]:William Jannen, Jun Yuan, Yang Zhan, Amogh Akshintala, John Esmet, **Yizheng Jiao**, Ankur Mittal, Prashant Pandey, and Phaneendra Reddy, Leif Walsh, Michael Bender, Martin FarachColton, Rob Johnson, Bradley C. Kuszmaul, Donald E. Porter. ***BetrFS: A Right-Optimized Write Optimized File System***. Santa Clara, USA. Jan, 2015.

[**SC′13**]:Xiaobing Li, Yandong Wang, **Yizheng Jiao**, Cong Xu, Weikuan Yu. ***Coomr: Cross-Task Coordination for Efficient Data Management in MapReduce Programs***. Denver, USA. November, 2013.

[**PACT′13**]:Bin Wang, Bo Wu, Dong Li, Xipeng Shen, Weikuan Yu, **Yizheng Jiao**, Jeffrey S. Veter. ***Exploring Hybrid Memory for GPU Energy Efficiency through Software-Hardware Co-Design***. Edinburgh, Scotland. September, 2013.

[**MASCOT′13**]:Bin Wang, **Yizheng Jiao**, Xipeng Shen, Dong Li, Weikuan Yu. ***A Versatile Performance and Energy Simulation Tool for GPU global memory***. San Francisco, USA. August, 2013.

[**BAWD′13**]:Yandong Wang, **Yizheng Jiao**, Cong Xu, Xiaobing Li, Teng Wang Xinyu Yue, Cristi Cira, Bin Wang, Zhuo Liu, Bliss Bailey, Weikuan Yu. ***Assessing the Performance Impact of HighSpeed Interconnects on MapReduce***. 2013.

TECHNOLOGY SKILLS

Programming Languages: C, Python, Java
Operating System and Services: Linux, AWS Cloud Services, Docker, Jenkins.

HONORS AWARDS

- Merit Student Scholarship of 2009, 2010, 2011;
- University-Wide Thesis Award of Chongqing University in 2009;
- National Aspiration Scholarship for two time in 2007 and 2009;
- Huawei Scholarship in 2006.