Yichen Jia

Curriculum Vitae

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yichenjia

Interests

- Storage System. Designing highly scalable, fully distributed, multi-threaded storage systems
- Hardware/Software Co-design. Customizing software with the hardware evolution
- Machine Learning. Applying machine learning technologies to optimize storage systems
- Firmware Management. Internal management of flash-based solid state drives(SSDs)

Education

08/14–05/20 **Ph.D.**, *Computer Science, Louisiana State University(LSU)*, Baton Rouge, Louisiana.
- Dissertation: Understanding and Optimizing Flash-based Key-value Systems in Data Centers
- Supervisor: Dr.Feng Chen(fchen@csc.lsu.edu)

09/09–06/13 **B.S. in Mathematics**, *Jilin University*, Changchun, China.
- Thesis: Seamless Instant Image Cloning Based on Derivative and Intensity Interpolation
- Supervisor: Dr.Tieru Wu(wutr@jlu.edu.cn)

Professional Experience

06/20–Now **Senior Performance Engineer**, *ARM, Inc.*, Austin, Texas.
- Investigating SPDK and NVMe over Fabrics on Arm's platforms, characterizing system performance, identifying bottlenecks, proposing solutions, and presenting results

05/19–08/19 **Engineering Intern**, *ARM, Inc.*, Austin, Texas.
- Implementing an UEFI Firmware driver to allocate a portion of DRAM to emulate PMEM on Arm-based servers, enabling DAX for EXT4, benchmarking popular key-value stores on the emulated PMEM

05/18–08/18 **Engineering Intern**, *ARM, Inc.*, Austin, Texas.
- Investigating NVMe and NVMe-over-Fabrics on ARM-based multi-core hardware (Broadcom Stingray), finding out bottlenecks of the system and proposing solutions to them

07/13–06/14 **Software Engineer**, *Appsoft Ltd*, Beijing.
- Implementing and integrating dozens of operators (statistic models) in the algorithm library in the software. This tool is designed with distributed, real-time and web support

Research Experience

08/14–05/20 **Research Assistant**, *Department of Computer Science, LSU*, Baton Rouge, Louisiana.
- Summarizing research works about flash memory, which focus on software, hardware, and interface
- Exploring the effect of deduplication inside SSD on the SSD-based caching system
- Customizing key-value caching system on open-channel SSDs with software/hardware co-design
- Exploiting the compression opportunities on the flash-based key-value caching system
- Proposing optimization methods for LSM-tree based key-value stores on 3D XPoint SSDs
- Applying and quantitatively comparing machine learning methods to improve system performance

09/11–06/13 **Research Assistant**, *Department of Mathematics, Jilin University*, ChangChun, China.
- Image Cloning based on the Poisson Equations. Reducing the computation overhead to 1/16 of the original method and maintain almost the same effect, with the use of the wavelet transform

Teaching Experience

09/14–05/16 **Teaching Assistant**, *Department of Computer Science, LSU*, Baton Rouge, Louisiana.
Numerical Methods (CSC2262)
Computer Science II with C++ (CSC1253)
Computer Organization (CSC3501)
Statistics and Graph Matlab (CSC1240)

Awards and Honors

2016-2020 Graduate Student Travel Award, HotStorage'16, MASCOTS'18, MSST'19, and ISPASS'20

2014 Outstanding Software Engineer in Appsoft

2013 Outstanding Student in Jilin University

2012 First Class Prize in Mathematical Contest of Modeling in Jilin Province

Technical Skills

Programming Languages: proficient in C/C++, Python, Java, Matlab, prior experience in HTML, JavaScript, PHP, Shell, Makefile

Operating Systems: Linux, Microsoft Windows, Android, iOS

Databases: MySQL, MongoDB, RocksDB, Memcached, Redis

Benchmarking Tools: YCSB, Memtier, db_bench, FIO, Perf

Development Kits: SPDK, PMDK

Disk Simulator: DiskSim

Source Control: Git

Publications

2020 **Yichen Jia** and Feng Chen, Kill Two Birds with One Stone: Auto-tuning RocksDB for High Bandwidth and Low Latency, to appear in Proceedings of 40th IEEE International Conference on Distributed Computing Systems(ICDCS'20), Singapore, July 8-10, 2020

2020 **Yichen Jia** and Feng Chen, From Flash to 3D XPoint: Performance Bottlenecks and Potentials in RocksDB with Storage Evolution, to appear in Proceedings of 2020 IEEE International Symposium on Performance Analysis of Systems and Software(ISPASS'20), Boston, MA, April 5-7, 2020

2020 **Yichen Jia**, Zili Shao, and Feng Chen, SlimCache: An Efficient Data Compression Scheme for Flash-based Key-value Caching, ACM Transactions on Storage, Vol. 16, Issue 3, 2020

2019 **Yichen Jia**, Eric Anger, and Feng Chen, When NVMe over Fabrics Meets Arm: Performance and Implications, 35th IEEE International Conference on Massive Storage Systems and Technology (MSST'19), Santa Clara, CA, May 20-24, 2019

2018 Zhaoyan Shen, Feng Chen, **Yichen Jia**, and Zili Shao, DIDACache: A Deep Integration of Device and Application for Flash Based Key-Value Caching, ACM Transactions on Storage, Vol. 14, Issue 3, 2018

2018 **Yichen Jia**, Zili Shao, and Feng Chen, SlimCache: Exploiting Data Compression Opportunities in Key-Value Caching Systems, 26th IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems(MASCOTS'18), Milwaukee, WI, Sept 25-28, 2018

2017 Zhaoyan Shen, Feng Chen, **Yichen Jia**, and Zili Shao, DIDACache: A Deep Integration of Device and Application for Flash Based Key-Value Caching, 15th USENIX Conference on File and Storage Technologies(FAST'17), Santa Clara, CA, Feb 27-Mar 2, 2017

2016 Zhaoyan Shen, Feng Chen, **Yichen Jia**, and Zili Shao, Optimizing Flash-based Key-value Cache Systems; 8th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage'16), Denver, CO, June 20-21, 2016

2014 **Yichen Jia** and Tieru Wu, Seamless Instant Image Cloning Based on Derivative and Intensity Interpolation, Journal of Information and Computational Science, 2014, 11(9): 3019-3028

Professional Service

2017 Peer Review and Referee for IEEE Transactions on Computers (TC) (1), International Conference on Parallel Processing (ICPP) (1), International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP) (1), IEEE Transactions on Big Data(TBD)(1), IEEE Access(1)