Yichen Jia

Curriculum Vitae

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Interests

- Storage System. Designing highly scalable, fully distributed, multi-threaded storage systems.
- Hardware/Software Co-design. Customizing software with the hardware evolution.
- Machine/Deep Learning. Applying machine learning technology to optimize storage systems.
- Resource Management. Resource balancing in computer systems, such as CPU, memory, I/O, etc.
- Firmware Management. Internal management of flash-based solid state drive, such as garbage collection, wear leveling, ECC, bad block management and over provisioning, etc.

Education

2014–present **Ph.D in Computer Science and Engineering**, *Louisiana State University*, Baton Rouge, LA.

2009–2013 **B.S in Mathematics**, *Jilin University*, Chang Chun, China.

Research Experience

2014–present **Research Assistant**, *Department of Computer Science, Louisiana State University*, Baton Rouge.

- Summarize most recent research works about flash memory, which focus on software, hardware and interface.
- Explore the effect of deduplication inside SSD on the SSD-based caching system.
- Customize key-value caching system on open-channel SSDs. Key-value caching system suffers from double mapping, double garbage collection, over-over-provisioning problems on commercial SSDs, we deploy it on the open-channel SSD and gain great performance improvement.
- Exploit the compression opportunities on the flash-based key-value caching system and improve the performance significantly.
- Propose optimization methods for LSM-tree based key-value stores on emerging storage medium.
- Deep learning on I/O systems. We use deep learning methods to improve the performance of I/O systems.

2011–2013 **Research Assistant**, *Department of Mathematics, Jilin University*, ChangChun.

- Image Cloning based on the Poisson Equations. We reduce the computation overhead to 1/16 of the original method and maintain almost the same effect, with the use of the wavelet transform.

Professional Experience

05/18–08/18 **Engineering Intern**, *Arm Inc*, Austin, TX.

- 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. The paper is published in MSST'19.
- Manager: Andrea Pellegrini (Andrea.Pellegrini@arm.com) Mentor: Eric Anger (Eric.Anger@arm.com)

07/13–06/14 **Software Engineer (full time)**, *Appsoft Ltd*, Beijing.

- Design and implement a GPU-accelerated finite element method(FEM) integrated distributed motion simulation software.
- Development of dozens of operators (statistic models) in the algorithms library. This tool is designed with distributed computing, real-time computing and web version support.

Teaching Experience

2014.09–2016.05 **Teaching Assistant**, *Department of Computer Science, LSU*, Baton Rouge.
Numerical Methods (CSC2262)
Computer Science II with C++ (CSC1253)
Computer Organization (CSC3501)
Statistics and Graph Matlab (CSC1240)

Awards and Honors

2018 Graduate Student Travel Award, MASCOTS'18

2016 Graduate Student Travel Award, HotStorage'16

2014 Outstanding Software Engineer in Appsoft.

2013 Outstanding Student in Jilin University.

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

2010-2013 Second Class Scholarship of Jilin University.

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

Disk Simulator: DiskSim

Source Control: git

Publications

2019 **Yichen Jia**, Eric Anger, 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**, 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, 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**, 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**, 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**,Tieru Wu, Seamless Instant Image Cloning Based on Derivative and Intensity Interpolation, Journal of Information and Computational Science, 2014, 11(9): 3019-3028.

Research Report

2018 **Yichen Jia**, SmartDedup: Efficient and Reliable Deduplication on Object Storage System, 2018. http://www.csc.lsu.edu/~yjia/papers/SmartDedup.pdf

2016 **Yichen Jia**, Research Problems and Opportunities about Flash Memory, 2016. http://www.csc.lsu.edu/~yjia/papers/flash_memory_research_opportunities.pdf

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)