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 Learning. Applying machine learning technology to optimize storage systems
- Resource Balancing. Resource allocation for computer systems, such as CPU, memory, I/O, etc.
- Firmware Management. Internal management of flash-based solid state drives(SSDs)

Education

2014–present **Ph.D in Computer Science**, *Louisiana State University(LSU)*, Baton Rouge, Louisiana.

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

Research Experience

2014–present **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 deep learning methods to improve the performance of I/O systems

2011–2013 **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

Professional Experience

05/19–08/19 **Engineering Intern**, *ARM Inc.*, Austin, Texas.

- Integrating and investigating persistent memory on Arm's infrastructure, enabling DAX for EXT4 on Arm, benchmarking popular key-value stores (e.g.MongoDB and Redis) on PM-aware file system
- Manager: Andrea Pellegrini (Andrea.Pellegrini@arm.com) Mentor: Eric Anger (Eric.Anger@arm.com)

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
- 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.

- Implementing and integrating dozens of operators (statistic models) in the algorithm library in the software. This tool is designed with distributed computing, real-time computing and web version support

Teaching Experience

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

Awards and Honors

2019 Graduate Student Travel Award, MSST'19

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

2020 **Yichen Jia**, Eric Anger, Nikos Nikoleris, Andrea Pellegrini, Jeremy Linton, and Feng Chen, Arm Machines with Persistent Memory: A Preliminary Performance Study and Implications, submitted to ICDCS'20

2020 **Yichen Jia**, Zili Shao, and Feng Chen, SlimCache: An Efficient Data Compression Scheme for Flash-based Key-value Caching, to appear in ACM Transactions on Storage

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

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)