

Yichen Jia

Curriculum Vitae

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in yichenjia

Summary

- 4+ year research and software development experience in designing and implementing highly scalable, fully distributed, multi-threaded, log-structured storage systems.
- 4+ year research experience about the management of flash-based solid state drive, such as garbage collection, wear leveling, ECC, bad block management and over provisioning, etc.
- 4+ year engineering experience about the system performance analysis, including bottleneck diagnosis and resource balancing between CPU, memory, storage and NIC, etc.
- 4+ year working experience about numerical analysis and mathematical modeling about image processing and 3D computer graphics.

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 cache 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.
 - Explore 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.
 - 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– **Teaching Assistant**, Department of Computer Science, LSU, Baton Rouge.

2016.05 Numerical Methods (CSC2262)

Computer Science II with C++ (CSC1253)

Computer Organization (CSC3501)

Statistics and Graph Matlab (CSC1240)

Awards and Honors

2018 Student Travel Award, MASCOTS'18

2016 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, Mementier, 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

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.

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

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

- 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
- 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)