

# Mai Zheng

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## Research Interests

Storage systems, computer systems, data-intensive computing

## Education

- 2009–2015 **Ph.D. & M.S. in Computer Science**, *The Ohio State University*, Columbus, OH,  
Advisor: Feng Qin.  
Ph.D. Thesis: Towards Manifesting Reliability Issues in Modern Computer Systems
- 2006–2009 **M.E. in Electronic Science & Technology**, *University of Science & Technology of China*, Hefei, China, Advisor: Li Guo.  
Master Thesis: Panoramic Video from Unstructured Webcams
- 2002–2006 **B.S. in Electronic Science & Technology**, *Qingdao University*, Qingdao, China.

## Professional Experience

- 2015–Present **Assistant Professor**, *New Mexico State University*, Las Cruces, NM.
- 2009–2015 **Research & Teaching Assistant**, *The Ohio State University*, Columbus, OH.
- 2012–2015 **Research Intern & Visiting Scholar**, *HP Labs*, Palo Alto, CA.  
Mentors: Joseph Tucek & Mark Lillibridge
- 2006–2009 **Research & Teaching Assistant**, *University of Science & Technology of China*, Hefei, China.

## Awards & Honors

- 2017–2020 NSF Award #1717630 (Principal Investigator), SHF: Small: Collaborative Research: Uncovering Vulnerabilities in Parallel File Systems for Reliable High Performance Computing
- 2016–2019 NSF Award #1559723 (Senior Personnel), REU Site: BIGDatA – Big Data Analytics for Cyber-Physical Systems
- 2016–2018 NSF Award #1566554 (Principal Investigator), CRII: CSR: Towards Pinpointing the Root Causes of Failures in Flash-based Storage Systems
- 2017 Travel Grant, College of Arts & Science, New Mexico State University
- 2016 Mini Grant, College of Arts & Science, New Mexico State University
- 2015 GERC (Graduate Engineering Research Colloquium) Award, The Ohio State Univ.
- 2014 USENIX OSDI Diversity Grant
- 2013 USENIX FAST Travel Grant

- 2011 ACM PPOPP Travel Grant
- 2009 University Fellowship, The Ohio State University
- 2008 Huawei Fellowship, Huawei Technologies Co. Ltd.

## Media Coverage

**Reliability of File System Checkers,** *StorageMojo*, [storagemojo.com/2017/03/02/fsck-interruptus-and-your-data/](http://storagemojo.com/2017/03/02/fsck-interruptus-and-your-data/).

**Reliability of Flash-based Solid State Drives,** *Slashdot*, [hardware.slashdot.org/story/13/03/01/224257/how-power-failures-corrupt-flash-ssd-data](http://hardware.slashdot.org/story/13/03/01/224257/how-power-failures-corrupt-flash-ssd-data); *The RISKS Digest*, [catless.ncl.ac.uk/Risks/27.18.html](http://catless.ncl.ac.uk/Risks/27.18.html); *ZDNet*, [www.zdnet.com/how-ssd-power-faults-scramble-your-data-7000011979](http://www.zdnet.com/how-ssd-power-faults-scramble-your-data-7000011979); *InfoWorld*, [www.infoworld.com/article/2613584/flash-storage](http://www.infoworld.com/article/2613584/flash-storage); etc.

## Peer-reviewed Publications

- IGSC'17 Li Li, Bruce Beitman, Mai Zheng, Xiaorui Wang and Feng Qin, "eDelta: Pinpointing Energy Deviations in Smartphone Apps via Comparative Trace Analysis". *Proceedings of the 8th International Green and Sustainable Computing Conference*, 2017
- IGSC'17 Li Li, Yunhao Bai, Xiaorui Wang, Mai Zheng and Feng Qin, "Selective Checkpointing for Minimizing Recovery Energy and Efforts of Smartphone Apps". *Proceedings of the 8th International Green and Sustainable Computing Conference*, 2017
- HotStorage'17 Om Rameshwar Gatla and Mai Zheng, "Understanding the Fault Resilience of File System Checkers". *Proceedings of the 9th USENIX Workshop on Hot Topics in Storage and File Systems*, 2017
- FAST'17 Om Rameshwar Gatla and Mai Zheng, "On Fault Resilience of File System Checkers". (WiP) *Work in Progress (WiP) & Poster Sessions, 15th USENIX Conference on File and Storage Technologies*, 2017
- NVMW'17 Simeng Wang, Jinrui Cao, Om Rameshwar Gatla, Muhammad Hameed, and Mai Zheng, "Do Not Blame Devices for All Failures ". *Poster Session, 8th Annual Non-Volatile Memories Workshop*, 2017
- REUNS'17 Yiliang Shi, Danny V. Murillo, Simeng Wang, Jinrui Cao, and Mai Zheng, "A Command-Level Study of Linux Kernel Bugs". *The 3rd National Workshop for REU Research in Networking and Systems*, 2017
- TOCS'16 Mai Zheng, Joseph Tucek, Feng Qin, Mark Lillibridge, Bill W Zhao, and Elizabeth S Yang, "Reliability Analysis of SSDs under Power Fault". *ACM Transactions on Computer Systems*, 2016
- SC'16 PDSW-DISCS Jinrui Cao, Simeng Wang, Dong Dai, Mai Zheng, and Yong Chen, "A Generic Framework for Testing Parallel File Systems". *Proceedings of the 1st Joint International Workshop on Parallel Data Storage and Data Intensive Scalable Computing Systems, held in conjunction with ACM/IEEE Supercomputing*, 2016
- NAS'16 Simeng Wang, Jinrui Cao, Danny V. Murillo, Yiliang Shi, and Mai Zheng, "Emulating Realistic Flash Device Errors with High Fidelity". *Proceedings of the 11th IEEE International Conference on Networking, Architecture, and Storage*, 2016

- KBS'16 Yongsheng Hao, Lina Wang, and Mai Zheng, "An Adaptive Algorithm for Scheduling Parallel Jobs in Meteorological Cloud". *Journal of Knowledge-based Systems*, 2016
- DOENet'16 Satyajayant Misra and Mai Zheng, "Rethinking Networking in a Non-volatile, Heterogeneous World". *Department of Energy (DOE) Workshop on Network Research Problems and Challenges*, 2016
- CSCI'15 Junwen Lu, Yongsheng Hao, Lina Wang, and Mai Zheng, "Towards Efficient Service Composition in Multi-Cloud Environment". *Proceedings of the 2nd International Conference on Computational Science and Computational Intelligence*, 2015
- NSFCloud'14 Mai Zheng, Joseph Tucek, Feng Qin, and Mark Lillibridge, "A Reliability Analysis Framework for Cloud Storage Systems". *NSFCloud Workshop on Experimental Support for Cloud Computing*, 2014
- OSDI'14 Mai Zheng, Joseph Tucek, Dachuan Huang, Feng Qin, Mark Lillibridge, Elizabeth S Yang, Bill W Zhao, and Shashank Singh, "Torturing Databases for Fun and Profit". *Proceedings of the 11th USENIX Symposium on Operating Systems Design and Implementation*, 2014
- TPDS'14 Mai Zheng, Vignesh T. Ravi, Feng Qin, and Gagan Agrawal, "GMRace: Detecting Data Races in GPU Programs via A Low-Overhead Scheme". *IEEE Transactions on Parallel and Distributed Systems*, 2014
- FAST'13 Mai Zheng, Joseph Tucek, Feng Qin, and Mark Lillibridge, "Understanding the Robustness of SSDs under Power Fault". *Proceedings of the 11th USENIX Conference on File and Storage Technologies*, 2013
- MASCOTS'13 Dachuan Huang, Xuechen Zhang, Wei Shi, Mai Zheng, Song Jiang, and Feng Qin, "LiU: Hiding Disk Access Latency for HPC Applications with a New SSD-Enabled Data Layout". *Proceedings of the 21st IEEE International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems*, 2013
- HiPC'12 Mai Zheng, Vignesh T. Ravi, Wenjing Ma, Feng Qin, and Gagan Agrawal, "GMProf: A Low-Overhead, Fine-Grained Profiling Approach for GPU Programs". *Proceedings of the 19th IEEE International Conference on High Performance Computing*, 2012
- WCRE'12 Dawei Qi, William Sumner, Feng Qin, Mai Zheng, Xiangyu Zhang and Abhik Roychoudhury, "Modeling Software Execution Environment". *Proceedings of the 19th Working Conference on Reverse Engineering*, 2012
- ASPLOS'11 Qi Gao, Wenbin Zhang, Zhezhe Chen, Mai Zheng, and Feng Qin, "2ndStrike: Towards Manifesting Hidden Concurrency Typestate Bugs". *Proceedings of the 16th ACM International Conference on Architectural Support for Programming Languages and Operating Systems*, 2011
- PPoPP'11 Mai Zheng, Vignesh T. Ravi, Feng Qin, and Gagan Agrawal, "GRace: A Low-Overhead Mechanism for Detecting Data Races in GPU Programs". *Proceedings of the 16th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming*, 2011
- JCEA'09 Jian Ji, Li Guo, Mai Zheng, and Lu Gao, "A Design of Programmable Pixel Shader for Mobile Devices". *Journal of Computer Engineering and Applications (Chinese)*, 2009

- ISVC'08 Mai Zheng, Xiaolin Chen, and Li Guo, "Stitching Video from Webcams". *Proceedings of the 4th International Symposium on Visual Computing*, 2008
- ICSP'08 Mai Zheng, Jian Ji, Li Guo, and Junzhu Zhu, "A Phase-Fitting Method for Sub-pixel Displacement Measurements Using Digital Speckle Images". *Proceedings of the 9th IEEE International Conference on Signal Processing*, 2008
- ICCSIT'08 Mai Zheng, Antai Guo, Wei Zhong, and Li Guo, "Image Stitching of Scenes with Large Misregistration". *Proceedings of International Conference on Computer Science and Information Technology*, 2008
- JCEA'08 Bingqin Wang, Li Guo, and Mai Zheng, "A Sub-Pixel Image Registration Algorithm for Panoramic Image Mosaics". *Journal of Computer Engineering and Applications (Chinese)*, 2008

## Teaching

- NMSU479/579 Special Topics: Modern Storage Systems: Flash, Cloud, & Beyond (Spring 2016)
- NMSU479/579 Special Topics: Reliable Storage Systems (Fall 2017)
- NMSU 474 Operating Systems I (Fall 2015, Fall 2016)
- NMSU 574 Operating Systems II (Spring 2017)
- NMSU 573 Computer Architecture II (Fall 2017)
- NMSU491/521 Parallel Programming (Fall 2016)
- OSU 4251 The UNIX Programming Environment (Fall 2014, Spring 2015)

## Student Mentoring

- Ph.D. Jinrui Cao (Spring 2016 – Present)
- Om Rameshwar Gatla (Summer 2016 – Present)
- Master Simeng Wang (Spring 2016 – Present)
- Muhammad Hameed (Spring 2017 – Present)
- Undergraduate Kristopher Chesney (NSF BIGDatA REU Program, 2017)
- Chelsea Deane (NSF BIGDatA REU Program, 2017)
- Danny V. Murillo (NSF BIGDatA REU Program, 2016)
- Yiliang Shi (NSF BIGDatA REU Program, 2016)

## Professional Activities

- Program IEEE/ACM International Symposium on Quality of Service (IWQoS), 2016, 2017;
- Committee IEEE Annual Computing and Communication Workshop and Conference (CCWC), 2017; The 3rd National Workshop for REU Research in Networking and Systems (REUNS), 2017; The 1st Workshop on Data-Centric Infrastructure for Big Data Science (DIBS), 2015.

Reviewer IEEE Transactions on Parallel and Distributed Systems (TPDS), 2013, 2015, 2016, 2017; ACM Transactions on Storage (TOS), 2016; ACM Transactions on Embedded Computer Systems (TECS), 2015; IEEE Transactions on Computers (TC), 2014, 2015; IET Computers & Digital Techniques, 2017; Kentucky Science & Engineering Foundation (KSEF), 2016.

Panelist National Science Foundation (NSF), 2016.

Others Campus Representative of USENIX Association, 2017.