Pengfei Zuo

Electrical and Computer Engineering Department, University of California, Santa Barbara (UCSB), CA 93106, USA

(+1) 313-398-5388 | pfzuo@ucsb.edu | pfzuo.github.io | github.com/pfzuo

Education

University of California, Santa Barbara (UCSB) *Santa Barbara, USA*
Joint Ph.D. in Electrical and Computer Engineering (Advisor: Yuan Xie) *2018/11 - 2019/11*

Huazhong University of Science and Technology (HUST) *Wuhan, China*
Ph.D. in Computer Science and Technology (Advisor: Yu Hua) *2014/09 - 2019/12*

Huazhong University of Science and Technology (HUST) *Wuhan, China*
B.S. in Computer Science and Technology *2010/09 - 2014/06*

Research & Service Summary

Pengfei Zuo has published 23 refereed papers, including 16 conference papers (OSDI, MICRO, USENIX ATC, SoCC, IPDPS, ICDCS, MSST, DATE, etc) and 7 journal papers (TPDS∗4, TOS, TCAD, and IEEE MICRO) in the areas of computer system and architecture, with a focus on non-volatile memory systems, storage systems and techniques (index structures, data deduplication & compression, key-value stores, etc), and security. The source codes of some research projects have been released at his Github page including Level Hashing (with 82 stars), Path Hashing (with 14 stars), and BEES (with 6 stars).

He has served as the reviewers of multiple journals and conferences including IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Cloud Computing, International Journal of Parallel Programming, Journal of Systems and Software, Journal of Computer Science and Technology, and Eurosys 2019.

Publications

1. **Pengfei Zuo**, Yu Hua, Jie Wu, "Level Hashing: A High-performance and Flexible-resizing Persistent Hashing Index Structure", Accepted and to appear in ACM Transactions on Storage (**TOS**), 2019.

2. **Pengfei Zuo**, Yu Hua, Ming Zhao, Wen Zhou, Yuncheng Guo, "Improving the Performance and Endurance of Encrypted Non-volatile Main Memory through Deduplicating Writes", in the 10-th Non-Volatile Memories Workshop (**NVMW**), 2019.

3. **Pengfei Zuo**, Yu Hua, Jie Wu, "Write-Optimized and High-Performance Hashing Index Scheme for Persistent Memory", in the 10-th Non-Volatile Memories Workshop (**NVMW**), 2019.

4. **Pengfei Zuo**, Yu Hua, Ming Zhao, Wen Zhou, Yuncheng Guo, "Write Deduplication and Hash Mode Encryption for Secure Non-volatile Main Memory", in **IEEE Micro**, vol. 39, no. 1, pp. 44-51, 2019.

5. **Pengfei Zuo**, Yu Hua, Yuanyuan Sun, Xue Liu, Jie Wu, Yuncheng Guo, Wen Xia, Shunde Cao, Dan Feng, "Bandwidth and Energy Efficient Image Sharing for Situation Awareness in Disasters", in IEEE Transactions on Parallel and Distributed Systems (**TPDS**), vol. 30, no. 1, pp. 15-28, 1 Jan. 2019.

6. **Pengfei Zuo**, Yu Hua, Jie Wu, "Write-Optimized and High-Performance Hashing Index Scheme for Persistent Memory", in Proceedings of the 13th USENIX Symposium on Operating Systems Design and Implementation (**OSDI**), 2018.

7. **Pengfei Zuo**, Yu Hua, Ming Zhao, Wen Zhou, Yuncheng Guo, "Improving the Performance and Endurance of Encrypted Non-volatile Main Memory through Deduplicating Writes", in Proceedings of the 51st IEEE/ACM International Symposium on Microarchitecture (**MICRO**), 2018.

8. **Pengfei Zuo** and Yu Hua, "SecPM: a Secure and Persistent Memory System for Non-volatile Memory", in Proceedings of 10th USENIX Workshop on Hot Topics in Storage and File Systems (**HotStorage**), 2018.

9. **Pengfei Zuo**, Yu Hua, Cong Wang, Wen Xia, Shunde Cao, Yukun Zhou, Yuanyuan Sun, "Mitigating Traffic-based Side Channel Attacks in Bandwidth-efficient Cloud Storage", in Proceedings of the 32nd IEEE International

Parallel and Distributed Processing Symposium (**IPDPS**), 2018.

10. **Pengfei Zuo** and Yu Hua, "A Write-friendly and Cache-optimized Hashing Scheme for Non-volatile Memory Systems", IEEE Transactions on Parallel and Distributed Systems (**TPDS**), Vol.29, No.5, May 2018, pages: 985-998.

11. **Pengfei Zuo** and Yu Hua, "A Write-friendly Hashing Scheme for Non-volatile Memory Systems", in Proceedings of the 33rd International Conference on Massive Storage Systems and Technology (**MSST**), 2017.

12. **Pengfei Zuo**, Yu Hua, Xue Liu, Dan Feng, Wen Xia, Shunde Cao, Jie Wu, Yuanyuan Sun, Yuncheng Guo, "BEES: Bandwidth- and Energy- Efficient Image Sharing for Real-time Situation Awareness", in Proceedings of the 37th International Conference on Distributed Computing Systems (**ICDCS**), 2017.

13. **Pengfei Zuo**, Yu Hua, Cong Wang, Wen Xia, Shunde Cao, Yukun Zhou, Yuanyuan Sun, "Mitigating Traffic-based Side Channel Attacks in Bandwidth-efficient Cloud Storage", in Proceedings of ACM Symposium on Cloud Computing (**SoCC**), 2017. (Abstract Only)

14. Yuncheng Guo, Yu Hua, **Pengfei Zuo**, "A Latency-optimized and Energy-efficient Write Scheme in NVM-based Main Memory", Accepted and to appear in IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), 2019.

15. Jie Wu, Yu Hua, **Pengfei Zuo** and Yuanyuan Sun, "Improving Restore Performance in Deduplication Systems via a Cost-Efficient Rewriting Scheme", in IEEE Transactions on Parallel and Distributed Systems (**TPDS**), vol. 30, no. 1, pp. 119-132, 1 Jan. 2019.

16. Yuncheng Guo, Yu Hua, **Pengfei Zuo**, "DFPC: A Dynamic Frequent Pattern Compression Scheme in NVM-based Main Memory", in Proceedings of the 21st Design Automation and Test in Europe (**DATE**), 2018.

17. Yuanyuan Sun, Yu Hua, Shunde Cao, **Pengfei Zuo**, "DLSH: A Distribution-aware LSH Scheme for Approximate Nearest Neighbor Query in Cloud Computing", in Proceedings of ACM Symposium on Cloud Computing (**SoCC**), 2017.

18. Yuanyuan Sun, Yu**Pengfei Zuo**, Yuanyuan Sun, "A Cost-efficient Rewriting Scheme to Improve Restore Performance in Deduplication Systems", in Proceedings of the 33rd International Conference on Massive Storage Systems and Technology (**MSST**), 2017.

19. Yuanyuan Sun, Yu Hua, Dan Feng, Ling Yang, **Pengfei Zuo**, Shunde Cao, Yuncheng Guo, "A Collision-Mitigation Cuckoo Hashing Scheme for Large-scale Storage Systems", IEEE Transactions on Parallel and Distributed Systems (**TPDS**), Vol.28, No.3, March 2017, pages: 619-632.

20. Wen Zhou, Dan Feng, Yu Hua, Jingning Liu, Fangting Huang, **Pengfei Zuo**, "Increasing Lifetime and Security of Phase-Change Memory with Endurance Variation", Proceedings of the IEEE International Conference on Parallel and Distributed Systems (**ICPADS**), 2016.

21. Yuanyuan Sun, Yu Hua, Dan Feng, Ling Yang, **Pengfei Zuo**, Shunde Cao, "MinCounter: An Efficient Cuckoo Hashing Scheme for Cloud Storage Systems", Proceedings of the 31st International Conference on Massive Storage Systems and Technology (**MSST**), 2015.

22. Jinjun Liu, Dan Feng, Yu Hua, Bin Peng, **Pengfei Zuo**, Yuanyuan Sun, "P-index: An Efficient Searchable Metadata Indexing Scheme Based on Data Provenance in Cold Storage", Proceedings of the 15th International Conference on Algorithms and Architectures for Parallel Processing (**ICA3PP**), 2015.

23. Jinjun Liu, Dan Feng, Yu Hua, Bin Peng, **Pengfei Zuo**, "Application-aware video-sharing services via provenance in cloud storage", Proceedings of the IEEE 33rd International Performance Computing and Communications Conference (**IPCCC**), 2014.

Work-in-Progress Reports & Posters

1. Zhangyu Chen, Yu Hua, **Pengfei Zuo**, Yuanyuan Sun, Yuncheng Guo, "Efficient Similarity-aware Image Compression via Approximation for NVM-based Main Memory", Poster in the 10th Annual Non-volatile Memories Workshop (**NVMW**), 2019.

2. **Pengfei Zuo**, Yu Hua, Ming Zhao, Wen Zhou, Yuncheng Guo, Yuanyuan Sun, "Enhancing Lifetime and Performance of Non-Volatile Memories through Eliminating Duplicate Writes", Work-in-Progress Report and Poster

in USENIX Conference on File and Storage Technologies (**FAST**), 2017.

3. Yuanyuan Sun, Yu Hua, Song Jiang, Qiuyu Li, Shunde Cao, **Pengfei Zuo**, "A Fast and Cost-Efficient Hashing Index Scheme for Cloud Storage Systems", Work-in-Progress Report and Poster in USENIX Conference on File and Storage Technologies (**FAST**), 2017.

4. **Pengfei Zuo**, Yu Hua, Dan Feng, Zhenhua Nie, Min Fu, Yuanyuan Sun, "E-STORE: An Energy-constrained Smartphone Storage for Near Real-time Disaster Image Sharing", Poster in the 13rd USENIX Conference on File and Storage Technologies (**FAST**), 2015.

Honors & Awards

2019	**Shenzhen Stock Exchange Scholarship** (CN¥12,000)
2019	**Finalist for the Memorable Paper Award in NVMW 2019**
	(Awarded to the best NVM-related papers published in the last two years)
2018	**National Scholarship for Ph.D. Graduate Students** (CN¥30,000)
2018	Excellent Graduate Student in HUST
2018	Student Grant from OSDI 2018
2018	Student Grant from MICRO 2018
2017	**National Scholarship for Ph.D. Graduate Students** (CN¥30,000)
2017	Excellent Graduate Student in HUST
2016	Excellent Graduate Student in HUST
2015	ZhiXing Excellent Graduate Scholarship (CN¥1,000)
2015	Excellent Graduate Student in HUST
2014	**Award of Excellent B.E. Thesis in Hubei Province**

Talks

Paper Presentation in NVMW 2019 — *San Deigo, USA*
Write-Optimized and High-Performance Hashing Index Scheme for Persistent Memory — *2019/03*

Paper Presentation in MICRO 2018 — *Fukuoka, Japan*
Improving the Performance and Endurance of Encrypted NVMM through Deduplicating Writes — *2018/10*

Paper Presentation in OSDI 2018 — *Carlsbad, USA*
Write-Optimized and High-Performance Hashing Index Scheme for Persistent Memory — *2018/10*

Invited Talk in National Conference of Information Storage (NCIS) — *Beijing, China*
Efficient Hashing Index Scheme for Non-volatile Memory — *2018/09*

Paper Presentation in IPDPS 2018 — *Vancouver, Canada*
Mitigating Traffic-based Side Channel Attacks in Bandwidth-efficient Cloud Storage — *2018/06*

Invited Talk in the Aliyun-CCF Excellent Paper Seminar — *Shanghai, China*
A Write-friendly and Cache-optimized Hashing Scheme for Non-volatile Memory Systems — *2018/04*

Invited Talk in National Conference of Information Storage (NCIS) — *Xi'an, China*
A Write-friendly Hashing Scheme for Non-volatile Memory Systems — *2017/09*

Paper Presentation in ICDCS 2017 — *Atlanta, USA*
BEES: Bandwidth- and Energy- Efficient Image Sharing for Real-time Situation Awareness — *2017/06*

Paper Presentation in MSST 2017 — *San Jose, USA*
A Write-friendly Hashing Scheme for Non-volatile Memory Systems — *2017/05*

Paper Presentation in MSST 2017 — *San Jose, USA*
A Cost-efficient Rewriting Scheme to Improve Restore Performance in Deduplication Systems — *2017/05*

Invited Talk in the 8th ChinaSys workshop — *Xiamen, China*
An Efficient Cuckoo Hashing Scheme for Cloud Storage Systems — *2015/06*