Chen Luo

Department of Computer Science, University of California, Irvine – Irvine – CA
949-372-8206 • cluo8@uci.edu

Research Interest

Database Storage Management, LSM-trees, Indexing

Education

University of California, Irvine, CA — *Sept. 2016–Dec. 2020*
Ph.D. in Computer Science. Supervisor: Michael J. Carey — GPA: 4.00/4.00
Thesis: On Optimizing LSM-based Storage for Big Data Management Systems

Tsinghua University, China — *Sept. 2013–July 2016*
M.Eng. in Software Engineering — GPA: 94.1/100 (2 out of 136)

Tongji University, China — *Sept. 2009–July 2013*
B.Eng. in Software Engineering — GPA: 4.72/5 (2 out of 169)

Research Experience

Efficient Maintenance and Exploitation of LSM-based auxiliary structures [PVLDB'19]

- Designed various primary lookup optimizations exploiting LSM-tree's multi-components design
- Proposed a Validation strategy to maintain LSM-based secondary indexes lazily and more efficiently
- Proposed a Delete-Bitmap strategy to maximize the pruning capabilities of LSM-based filters

Minimizing LSM-tree's Write Stalls via Novel Merge Scheduling [PVLDB'20]

- Proposed a two-phase evaluation approach to evaluate write stalls of various LSM-tree designs
- Proposed a novel greedy merge scheduler to minimize write stalls of LSM-trees
- Substantially reduced percentile write latencies without impacting write throughput

Adaptive Memory Management of LSM-trees [Under Submission]

- Proposed a memory management architecture to enable adaptive memory management for LSM-trees
- Proposed a new memory component structure to better exploit large memory to minimize write costs
- Designed and implemented a memory tuner to tune optimal memory allocation between write memory and buffer cache

Internship Experience

Research Intern, Microsoft Research, Redmond — *June 2019–Sep. 2019*

- Mentor: David Lomet
- Built a customized SSD controller on open-channel SSDs while supporting variable-size pages

Research Intern, IBM Almaden Research Center — *June 2017–Sep. 2017*

- Mentor: Pinar Tozun, Yuanyuan Tian
- Designed and implemented a multi-zone indexing method for HTAP systems that provides a unified view for evolving data [EDBT'19]

Software Developer Intern, eBay China Development Center — *July 2012–Mar. 2013*

- Participated in the development of eBay's web application framework
- Redeveloped the internal web traffic analytics system with MapReduce

Selected Publications

[1] **Chen Luo**, Michael J. Carey. LSM-based storage techniques: a survey. *VLDB Journal*, 29 (1), pp. 393–418, 2020

[2] **Chen Luo**, Michael J. Carey. Efficient data ingestion and query processing for LSM-based storage systems. *PVLDB*, 12(5), pp. 531–543, 2019

[3] **Chen Luo**, Michael J. Carey. On performance stability in LSM-based storage systems. *PVLDB*, 13(4), pp. 449–462, 2019

[4] **Chen Luo**, Pinar Tozun, Yuanyuan Tian, Ronald Barber, Vijayshankar Raman, and Richard Sidle. Umzi: Unified Multi-Zone Indexing for Large-scale HTAP. *EDBT*, pp. 1–12, 2019

[5] **Chen Luo**, Michael J. Carey. Breaking down memory walls: adaptive memory management for LSM-based storage systems. *Under submission*