KAN WU

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RESEARCH INTERESTS

Operating Systems, Databases and Distributed Systems

EDUCATION

Ph.D. in Computer Science, UW-Madison / 2016.09 – 2022.05 (expected)
advised by Professor Andrea Arpaci-Dusseau and Remzi Arpaci-Dusseau

B.Eng. in Computer Science, University of Science and Technology of China / 2012.09 – 2016.06
Rank: 5/107, Outstanding Graduate

RESEARCH EXPERIENCE

Optimizing Caching for Modern Storage Hierarchies (FAST'21, NVM'21)
advised by Prof. Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau
Proposed multi-factor caching, a new approach to derive peak performance from modern storage hierarchies with emerging devices (e.g., Optane DC PM, Optane SSD, Flash SSD).

Multi-tenant Persistent Memory Caching (Ongoing)
advised by Prof. Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau
Developing a consolidated persistent memory caching system that can automatically minimize and regulate interferences across multi-tenants, hence realize sharing goals such as QoS guarantee, resource-limit, fairness and proportional resource sharing.

Building Search Engines for Tiny Memory and Flash Hierarchies (FAST'20)
advised by Prof. Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau
Designed a new search engine that efficiently uses SSDs with tiny amounts of main memory. Proposed multiple techniques, including optimized data layout, a novel Bloom filter, adaptive prefetching, and space-time trade-offs.

Performance Characterization of Persistent Memory Devices (HotStorage'19, DaMoN'19)
advised by Prof. Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau
Formalized rules to be followed by the users of Intel Optane SSD (a popular NVM-based block device). Examined Optane SSD's internals to provide insights into each rule.

Field-Granularity DRAM/NVM Caching for Relational Databases (Ongoing)
advised by Prof. Xiangyao Yu, Tianzhen Wang
Designing field-granularity caching mechanisms and policies for in-memory relational databases based on DRAM and NVM hierarchies.

PUBLICATIONS

[1] Releasing Locks As Early As You Can: Reducing Contention of Hotspots by Violating Two-Phase Locking Zhihan Guo, Kan Wu, Cong Yan, Xiangyao Yu **SIGMOD'2021**

[2] The Storage Hierarchy is Not a Hierarchy: Optimizing Caching on Modern Storage Devices with Orthus Kan Wu, Zhihan Guo, Guanzhou Hu, Kaiwei Tu, Ramnatthan Alagappan, Rathijit Sen, Kwanghyun Park, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau**, FAST'2021**

[3] Read as Needed: Building WiSER, a Flash-Optimized Search Engine Jun He, Kan Wu, Sudarsun Kannan, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, **FAST'2020**

[4] Towards an Unwritten Contract of Intel Optane SSD Kan Wu, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, **HotStorage'2019**

[5] Exploiting Intel Optane SSD for Microsoft SQL Server Kan Wu,Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, Rathijit Sen, Kwanghyun Park, SIGMOD, DaMoN'2019

[6] The Storage Hierarchy is Not a Hierarchy: Optimizing Caching on Modern Storage Devices with Orthus Kan Wu, Zhihan Guo, Guanzhou Hu, Kaiwei Tu, Ramnatthan Alagappan, Rathijit Sen, Kwanghyun Park, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, NVMW'2021

HONORS AND AWARDS

Summer Research Award, UW-Madison / 2017

Outstanding Graduate, USTC / 2016

Winner Algorithm, IEEE Congress on Evolutionary Computation / 2015

Tencent Innovation Scholarship / 2014

PROFESSIONAL EXPERIENCE

Research Assistant, Microsoft Gray System Lab / 2018.05 – Present

Mentor: Kwanghyun Park, Rathijit Sen

Software Engineering Intern, VMWare / 2019.05 – 2019.08

Mentor: Wenguang Wang

Research Assistant, Chinese University of Hong Kong / 2016.01 – 2016.06

Mentor: Prof. Patrick P.C. Lee, Qun Huang

SKILLS & RELEVANT COURSEWORK

Programming language: C, C++, Python, Java.

Relevant coursework: operating system, computer architecture, distributed system, database.