

KAI WU

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RESEARCH INTERESTS

High-performance computing (large-scale parallel/distributed systems). In particular, I am working on (i) Heterogeneous computing; (ii) Parallel programming models and runtime; (iii) Performance optimization and modeling; (iv) Non-volatile memory (NVM).

EDUCATION

- University of California, Merced, CA, USA** *June 2016 - Now*
Ph.D., in Electrical Engineering and Computer Sciences
Advisor: Dong Li
- Michigan State University, East Lansing, MI, USA** *Aug 2014 - May 2016*
M.S., in Computer Science and Engineering
Advisor: Yiyong Tong
- Harbin Normal University, Harbin, CHINA** *Aug 2010 - Jun 2014*
B.S., Digital Media Technology

RESEARCH EXPERIENCE

- University of California, Merced** *Aug 2016 - Now*
Research Assistant *Work with Prof. Dong Li*
- Data management on heterogeneous memory system in data center (virtual machine) [ongoing]
 - High-performance transaction processing on persistent memory (SQL and Non-SQL databases)
 - Data management on heterogeneous memory system for HPC applications (MPI and OpenMP-task)
 - Crash consistence in NVM-based system
 - I/O implications of NVM-based system
- Lawrence Livermore National Laboratory** *May 2018 - Aug 2018*
Research Intern *Work with Dr. Maya B Gokhale*
- Design, implement and evaluate pre-fetch and eviction optimizations using the user faulted approach for efficient access to mapped files in persistent memory
- Los Alamos National Laboratory** *May 2017 - Aug 2017*
Research Intern *Work with Dr. Nathan DeBardeleben and Dr. Qiang Guan*
- Characterizing and modeling application resilience difference between serial and parallel executions

PUBLICATION

[SC'18] **Kai Wu**, Jie Ren and Dong Li. "Runtime Data Management on Non-Volatile Memory-based Heterogeneous Memory for Task-Parallel Programs". In 30th ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis, 2018.

[ICPP'18] **Kai Wu**, Wenqian Dong, Qiang Guan, Nathan Debardeleben and Dong Li. "Modeling Application Resilience in Large Scale Parallel Execution". In 47th International Conference on Parallel Processing.

[MCHPC'18] Jie Ren, **Kai Wu** and Dong Li. "Understanding Application Recomputability without Crash Consistency in Non-Volatile Memory". In Workshop on Memory Centric High Performance Computing held in conjunction with SC18.

[SC'17] **Kai Wu**, Yingchao Huang and Dong Li, Unimem: Runtime Data Management in Non-Volatile Memory-based Heterogeneous Main Memory. In 29th ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis, 2017.

[SC'17] **Kai Wu**, Qiang Guan, Nathan DeBardeleben and Dong Li, Characterization and Comparison of Application Resilience for Serial and Parallel Executions. Poster in 29th ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis, 2017.

[Cluster'17] Shuo Yang, **Kai Wu**, Yifan Qiao, Dong Li and Jidong Zhai", Algorithm-Directed Persistent Memory for High Performance Computing". In 19th IEEE Cluster Conference.

[NAS'17] Wei Liu, **Kai Wu**, Jialin Liu, Feng Chen and Dong Li, Performance Evaluation and Modeling of HPC I/O on Non-Volatile Memory. In 12th International Conference on Networking, Architecture, and Storage.

Kai Wu, Jie Ren and Dong Li. "Archa: Architecture-Aware, High Performance Transaction for Persistent Memory" (In submission)

Kai Wu, Yingchao Huang and Dong Li. High Performance Data Persistence in Non-Volatile Memory for Resilient High Performance Computing (In submission)

[TR] **Kai Wu**, Frank Ober, Shari Hamlin, Qiang Guan and Dong Li, Early Evaluation of Intel Optane Non-Volatile Memory with HPC I/O Workloads. Technical Report, PASA Lab, UC Merced.

PROFESSIONAL ACTIVITIES

External Reviewers: SC'18, IPDPS'17, CLUSTER'17, HPCC'17, NAS'17, etc.

Student Volunteer: SC'18, SC'16

AWARDS

Student Travel Award: SC'18, OSDI'18, ASPLOS'18, NVMW'18, CLUSTER'17, NVMW'17, SC'16

Graduate Travel Fellowship, University of California, Merced, 2018

Bobcat Graduate Research Fellowship, University of California, Merced 2017

First-Prize, LanQiao Cup National Collegiate Programming Contest, C/C++ group, 2013

Honorable Mention, ACM/ICPC International Collegiate Programming Contest China Tonghua Invitational Contest, 2013

Honorable Mention, ACM/ICPC International Collegiate Programming Contest China Hei Longjiang Province Contest, 2013

China National Scholarship, 2013

China National Advanced Outstanding Student Awards, 2013

First Class Scholarship of Harbin Normal University, 2011- 2014

PROGRAMMING SKILLS

C/C++, Python, Java, Fortran, MPI, OpenMP, GPU (CUDA)

TEACHING

University of California, Merced

Jul 2016 - Aug 2016

Teaching Assistant

· CSE20 - Introduction to Computing I (Java Basic)