Jie Ren

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EDUCATION

Ph.D. in Computer Science and Engineering   Aug. 2017 - Present
- University of California, Merced
- Advisor: Prof. Dong Li

Bachelor of Computer Engineering   Aug. 2013 - Jun. 2017
- Beijing Institute of Technology

RESEARCH INTERESTS

System Optimization for Machine Learning, High Performance Computing

PUBLICATIONS

1. <u>Jie Ren</u>, Samyam Rajbhandari, Reza Yazdani Aminabadi, Olatunji Ruwase, Shuangyan Yang, Minjia Zhang, Dong Li and Yuxiong He. **"ZeRO-Offload: Democratizing Billion-Scale Model Training"**. In 27th USENIX Annual Technical Conference. ATC'21.

2. <u>Jie Ren</u>, Jiaolin Luo, Ivy Peng, Kai Wu, and Dong Li, **"Optimizing Large-Scale Plasma Simulations on Persistent Memory-based Heterogeneous Memory with Effective Data Placement Across Memory Hierarchy"**. In 35th International Conference on Supercomputing. ICS'21.

3. <u>Jie Ren</u>, Jiaolin Luo, Kai Wu, Minjia Zhang, Hyeran Jeon, and Dong Li, **"Sentinel: Efficient Tensor Migration and Allocation on Heterogeneous Memory Systems for Deep Learning"**. In 27th IEEE International Symposium on High-Performance Computer Architecture. HPCA'21.

4. Kai Wu, <u>Jie Ren</u>, Ivy Peng and Dong Li. **"ArchTM: Architecture-Aware, High Performance Transaction for Persistent Memory"**. In 19th USENIX Conference on File and Storage Technologies. FAST'21.

5. Jiawen Liu, <u>Jie Ren</u>, Roberto Gioiosa, Dong Li and Jiajia Li. **"Sparta: High-Performance, Element-Wise Sparse Tensor Contraction on Heterogeneous Memory."**. In 26th Principles and Practice of Parallel Programming. PPoPP'21.

6. <u>Jie Ren</u>, Jiaolin Luo, Kai Wu, Minjia Zhang, and Dong Li, **"HM-ANN: Efficient Billion-Point Nearest Neighbor Search on Heterogeneous Memory"**. In 34th Conference on Neural Information Processing Systems. Neurips'20.

7. <u>Jie Ren</u>, Kai Wu, and Dong Li, **"EasyCrash: Exploring Non-Volatility of Non-Volatile**

Memory for High Performance Computing Under Failures". In IEEE International Conference on Cluster Computing. CLUSTER'20.

8. Kai Wu, Ivy B. Peng, <u>Jie Ren</u>, and Dong Li, **"Ribbon: High Performance Cache Line Flushing for Persistent Memory"**. In 29th International Conference on Parallel Architectures and Compilation Techniques. PACT'20.

9. Ivy B. Peng, Kai Wu, <u>Jie Ren</u>, Maya Gokhale and Dong Li, **"Demystifying the Performance of HPC Scientific Applications on Non-Volatile Memory-based Memory Systems"**. Accepted in International Parallel and Distributed Processing Symposium. IPDPS'20. New Orleans, LA, USA, 2020.

10. <u>Jie Ren</u>, Chunhua Liao, and Dong Li, **"Opera: Similarity Analysis on Data Access Patterns of OpenMP Tasks to Optimize Task Affinity"**. In workshop on High-level Parallel Programming Models and Supportive Environments. HIPS'19. Rio de Janeiro, Brazil, 2019.

11. <u>Jie Ren</u>, Kai Wu, and Dong Li, **"Understanding Application Recomputability without Crash Consistency in Non-Volatile Memory"**. In Workshop on Memory Centric Programming for HPC. MCHPC'18. Dallas, TX, USA, 2018.

12. Kai Wu, <u>Jie Ren</u>, 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. SC'18. Dallas, TX, USA, 2018.

RESEARCH EXPERIENCES

Student Researcher   Aug. 2017 – Present
University of California, Merced, CA
PI: Dong Li
Developing practical techniques to solve memory management issues in the parallel computing system.

Research Intern   May. 2020 – Aug. 2020
Microsoft
Mentor: Samyam Rajbhandari, Minjia Zhang
Exploring large scale machine learning models training.

Research Intern   May. 2018 – Aug. 2018
Lawrence Livermore National Laboratory
Mentor: Leo (Chunhua) Liao
Improving OpenMP tasks scheduling policy.

TEACHING and SERVICE

Teaching Assistant (University of California, Merced): Advanced Programming, Introduction to Programming, Discrete Mathematics, Computer Organization

Reviewer: ICS, Cluster, SC, IPDPS, ICPP