Feng Zhang (Associate Professor, Renmin University of China)

Contact Information

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Research Interests

HPC, Heterogeneous Computing, and Parallel and Distributed Systems

Education

Tsinghua University, Beijing, China

Ph.D., Computer Science and Technology, Summer 2017

- Topic: *Performance Optimizations on Integrated CPU/GPU Architectures*
- Advisors: Professor Wenguang Chen, and Professor Jidong Zhai

Xidian University, Xi'an, China

B.S., School of Computer Science and Engineering, July 2012

- *Summa Cum Laude*

Research Experience

Associate Professor July 2020 to present
Assistant Professor September 2017 to July 2020
Renmin University of China, Beijing, China

Visiting Scholar April 2016 to November 2016
Department of Computer Science,
North Carolina State University, Raleigh, NC, USA
Supervisor: Professor Xipeng Shen

Intern August 2013 to December 2013
Deep Neural Networks Research Group
AMD, Beijing China
Mentor: Junli Gu, Ph.D

Professional Activities

- PC for CODS-COMAD'22, HiPC'21, BigData'21, Cluster'21, CCGrid'21, IPDPS'21, NPC'20, SBAC-PAD'20, ICPP'20, HiPC'20, PC for NPC'19, CIKM'19, HPC China'19, Publication Chair for NPC'18. PC for ICPADS'18, HPC China'18. External Reviewer for SC'18, ICS'18, ICPP'18.
- Reviewer for TPDS, TC, JPDC, FCS, The Journal of Supercomputing, JCST, ACM Computing Surveys, TNSE, TSUSC, and TCC.

Personal Profile

- Specialties: accelerators, AMD GPU/CPU/APU, NVIDIA GPU, Intel GPU/MIC
- Strong programming skills in OpenCL and CUDA
- Familiar with parallel programming language (OpenMP, MPI, Pthreads)
- Document Analytics using Spark on Amazon EC2
- Language: English and Chinese

Awards

- ICPP'20 best paper candidate 2020
- SIGHPC China Rising Star 2020

Research and Publication Record
Feng Zhang

Research Project:

- Research on key technologies for performance optimization of intelligent distributed storage systems, 2019-2022, Beijing Natural Science Foundation, project leader;
- Research on key technologies of irregular load division and optimization for integrated architecture, 2019-2021, National Natural Science Foundation of China, project leader;
- Research on performance isolation and performance optimization of Ceph object storage system, 2019-2020, SenseTime Youth Research Fund, project leader;
- Research on big data systems for new hardware, 2018-2020, scientific research fund of Renmin University of China, project leader;
- Research on key technologies of fine-grained load analysis and optimization for integrated heterogeneous platforms, 2017-2019, China Postdoctoral Science Foundation, project leader

Publication：

- [TPDS'21] "Fine-Grained Multi-Query Stream Processing on Integrated Architectures", Feng Zhang, Chenyang Zhang, Lin Yang, Shuhao Zhang, Bingsheng He, Wei Lu, Xiaoyong Du. TPDS, 2021.
- [TKDE'21] "Periodic Weather-Aware LSTM with Event Mechanism for Parking Behavior Prediction", Feng Zhang, Yani Liu, Ningxuan Feng, Cheng Yang, Jidong Zhai, Shuhao Zhang, Bingsheng He, Jiazao Lin, Xiao Zhang, Xiaoyong Du. IEEE Transactions on Knowledge and Data Engineering, 2021 (TKDE 2021).
- [TPDS'21] "DTransE: Distributed Translating Embedding for Knowledge Graph", Dandan Song, Feng Zhang, Meiyan Lu, Sicheng Yang, Heyan Huang. IEEE Transactions on Parallel and Distributed Systems, 2021 (TPDS 2021).
- [TPDS'21] "YuenyeungSpTRSV: A Thread-Level and Warp-Level Fusion Synchronization-Free Sparse Triangular Solve", Feng Zhang, Jiya Su, Weifeng Liu, Bingsheng He, Ruofan Wu, Xiaoyong Du, Rujia Wang. IEEE Transactions on Parallel and Distributed Systems, 2021 (TPDS 2021).
- [ICDE'21] "G-TADOC: Enabling Efficient GPU-Based Text Analytics without Decompression", Feng Zhang, Zaifeng Pan, Yanliang Zhou, Jidong Zhai, Xipeng Shen, Onur Mutlu, Xiaoyong Du. 37th IEEE International Conference on Data Engineering (ICDE 2021).
- [TPDS'21] "An Efficient Parallel Secure Machine Learning Framework on GPUs", Feng Zhang, Zheng Chen, Chenyang Zhang, Amelie Chi Zhou, Jidong Zhai, Xiaoyong Du. IEEE Transactions on Parallel and Distributed Systems, 2021 (TPDS 2021).

- [PPoPP'21] "POSTER: Exploring Deep Reuse in Winograd CNN Inference", Ruofan Wu, Feng Zhang, Zhen Zheng, Xiaoyong Du, Xipeng Shen. 26th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming, Seoul, S. Korea (PPoPP 2021).
- [TPDS'20] "iMLBench: A Machine Learning Benchmark Suite for CPU-GPU Integrated Architectures", Chenyang Zhang, Feng Zhang, Xiaoguang Guo, Bingsheng He, Xiao Zhang, and Xiaoyong Du. IEEE Transactions on Parallel and Distributed Systems, 2020.
- [NPC'20] "Payment Behavior Prediction and Statistical Analysis for Shared Parking Lots", Qingyu Xu, Feng Zhang, Mingde Zhang, Jidong Zhai, Jiazao Lin,Haidi Liu, Xiaoyong Du. International Conference on Network and Parallel Computing (NPC 2020).
- [VLDBJ'20] "TADOC: Text Analytics Directly on Compression", Feng Zhang, Jidong Zhai, Xipeng Shen, Dalin Wang, Zheng Chen, Onur Mutlu, Wenguang Chen, Xiaoyong Du. VLDB Journal.
- [ICPP'20] "CapelliniSpTRSV: A Thread-Level Synchronization-Free Sparse Triangular Solve on GPUs", Jiya Su, Feng Zhang, Weifeng Liu, Bingsheng He, Ruofan Wu, Xiaoyong Du, Rujia Wang. The 49th International Conference on Parallel Processing (ICPP 2020), 17-20 August 2020, Edmonton, AB, Canada.
- [ICPP'20] "ParSecureML: An Efficient Parallel Secure Machine Learning Framework on GPUs", Zheng Chen, Feng Zhang, Amelie Chi Zhou, Jidong Zhai, Chenyang Zhang, Xiaoyong Du. The 49th International Conference on Parallel Processing (ICPP 2020), 17-20 August 2020, Edmonton, AB, Canada.
- [Journal of Software'20] "Survey on Performance Analysis, Optimization, and Applications of Heterogeneous Fusion Processors", Feng Zhang, Jidong Zhai, Zheng Chen, Jiazao Lin, Xiaoyong Du. Journal of Software, 2020.
- [USENIX ATC'20] "FineStream: Fine-Grained Window-Based Stream Processing on CPU-GPU Integrated Architectures", Feng Zhang, Lin Yang, Shuhao Zhang, Bingsheng He, Wei Lu, Xiaoyong Du. USENIX ATC, September 2020.
- [IJCAI'20] "PewLSTM: Periodic LSTM with Weather-Aware Gating Mechanism for Parking Behavior Prediction", Feng Zhang, Ningxuan Feng, Yani Liu, Cheng Yang, Jidong Zhai, Shuhao Zhang, Bingsheng He, Jiazao Lin, Xiaoyong Du. IJCAI, July 2020.
- [ICDCS'20] "Exploration of TransE in a Distributed Environment", Meiyan Lu, Dandan Song, Feng Zhang, Lejian Liao. ICDCS Poster, July 2020.
- [SIGMOD Record'20] "Hardware-Conscious Stream Processing: A Survey", Shuhao Zhang, Feng Zhang, Yingjun Wu, Bingsheng He, Paul Johns. ACM SIGMOD Record, February 2020.

- [TPDS'20] "Modeling Analysis and Cost-performance Ratio Optimization of Virtual Machine Scheduling in Cloud Computing", Bo Wan, Jiale Dang, Zhetao Li, Hongfang Gong, Feng Zhang, Sangyoon Oh. IEEE Transactions on Parallel and Distributed Systems, 2020.
- [ICDE'20] "Towards Concurrent Stateful Stream Processing on Multicore Processors", Shuhao Zhang, Yingjun Wu, Feng Zhang, Bingsheng He. IEEE ICDE, 2020.
- [ICDE'20] "Enabling Efficient Random Access to Hierarchically-Compressed Data", Feng Zhang, Jidong Zhai, Xipeng Shen, Onur Mutlu, and Xiaoyong Du. IEEE ICDE, 2020.
- [TKDE'19] "Automatic Irregularity-Aware Fine-Grained Workload Partitioning on Integrated Architectures", Feng Zhang, Jidong Zhai, Bo Wu, Bingsheng He, Wenguang Chen, Xiaoyong Du. IEEE Transactions on Knowledge and Data Engineering, 2019.
- [NPC'19] "Statistical Analysis and Prediction of Parking Behavior", Ningxuan Feng, Feng Zhang, Jiazao Lin, Jidong Zhai, Xiaoyong Du. The 16th IFIP International Conference on Network and Parallel Computing (NPC), 2019, Inner Mongolia, China.
- [ICPP'19] "Distributed Join Algorithms on Multi-GPU Clusters with GPUDirect RDMA", Chengxin Guo, Hong Chen, Feng Zhang, Cuiping Li. The 48th International Conference on Parallel Processing (ICPP 2019), August 5–8, 2019, Kyoto, Japan.
- [CCF THPC'19] "Performance evaluation and analysis of sparse matrix and graph kernels on heterogeneous processors", Feng Zhang, Weifeng Liu, Ningxuan Feng, Jidong Zhai, Xiaoyong Du. CCF Transactions on High Performance Computing, 2019.
- [HPCC'19] "Parallel Hybrid Join Algorithm on GPU", Chengxin Guo, Hong Chen, Feng Zhang, Cuiping Li. The 21st IEEE International Conference on High Performance Computing and Communications (HPCC 2019), August 10–12, 2019, China.
- [Journal of Software'19] "History, Present, and Future of Big Data Management Systems", Xiaoyong Du, Wei Lu, Feng Zhang. Journal of Software, 2019.
- [VLDB'18] "Efficient Document Analytics on Compressed Data: Method, Challenges, Algorithms, Insights", Feng Zhang, Jidong Zhai, Xipeng Shen, Onur Mutlu, and Wenguang Chen. The 44th International Conference on Very Large Data Bases, Rio de Janeiro, Brazil, August 27-31, 2018.
- [ICS'18] "Zwift: A Programming Framework for High Performance Text Analytics on Compressed Data", Feng Zhang, Jidong Zhai,Xipeng Shen, Onur Mutlu, and Wenguang Chen. The 32nd ACM International Conference on Supercomputing, Beijing, China, June 12-15, 2018.
- [TJSC'18] "An Adaptive Breadth-First Search Algorithm on Integrated Architectures", Feng Zhang, Heng Lin, Jidong Zhai, Jie Cheng, Dingyi Xiang, Jizhong Li, Yunpeng

Chai, Xiaoyong Du. The Journal of Supercomputing, 2018.

- [CGO'17] "FinePar: Irregularity-Aware Fine-Grained Workload Partitioning on Integrated Architectures", Feng Zhang, Jidong Zhai, Wenguang Chen, Bingsheng He and Shuhao ZhangHe. Proceedings of the 2017 International Symposium on Code Generation and Optimization. IEEE Press, 2017: 27-38.
- [TPDS'17] "Understanding Co-running Behaviors on Integrated CPU/GPU Architectures", Feng Zhang, Jidong Zhai, Bingsheng He, Shuhao Zhang, Wenguang Chen. IEEE Transactions on Parallel and Distributed Systems, 2017, 28(3): 905-918.
- [SCIS'16] "Characterizing and optimizing TPC-C workloads on large-scale systems using SSD arrays", ZHAI JiDong, ZHANG Feng, LI QingWen, CHEN WenGuang, ZHENG WeiMin. SCIENCE CHINA Information Sciences, 2016, 59(9): 92104.
- [MASCOTS'15] "To Co-Run, or Not To Co-Run: A Performance Study on Integrated Architectures", Feng Zhang, Jidong Zhai, Wenguang Chen, Bingsheng He and Shuhao Zhang. IEEE 23nd International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, October 5-7, 2015, Atlanta, GA, USA.
- [ICPPW'15] "HPC-Oriented Power Evaluation Method", Feng Zhang, and Liang Chen. IEEE 44th International Conference on Parallel Processing Workshops, 2015, China.
- [APSys'14] "Implementation and Evaluation of Deep Neural Networks (DNN) on Mainstream Heterogeneous Systems", Junli Gu, Maohua Zhu, Zhitao Zhou, Feng Zhang, Zhen Lin, Qianfeng Zhang, Mauricio Breternitz. Proceedings of 5th Asia-Pacific Workshop on Systems, ACM, June 25-26, 2014, Beijing, China.