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Keren Zhou

Research Interests

- Multi-core Algorithms
- Distributed Systems

Education

2014-2017 (expected) **M.S. in Computer Architecture,** *Institute of Computing Technology, Chinese Academy of Sciences*
Adviser: Guangming Tan (`http://www.ncic.ac.cn/~tgm`)
GPA: 90/100

2010-2014 **B.E. in Network Engineering,** *School of Software, Yunnan University*
Adviser: Wei Zhou
Thesis: A Practical Concurrent Quadtree
GPA: 92/100 *Rank:* 1/290

Research Experience

2015.6-present Research Assistant, Nvidia-Sugon-ICT Deep Learning Joint Laboratory, Institute of Computing Technology, Chinese Academy of Sciences

High Performance Deep Learning Framwork

- Participated in ISBI challenge, ranking 24.
- Improved the performance of neural networks on modern architectures.
  - Boosted the performance using a coarse-grained parallelism strategy with fine-grained vectorization and blocking techniques on CPU.
  - Wrote assembly codes to promote the instruction bandwidth and data reuse rate on GPU.
- Developed a deep learning framework for biological applications, with an auto-tuning tool to select the best algorithm for each layer. The framework is 5 times faster than Caffe in Alexnet and 12 times faster in Lenet on a 16 core machine.

2013.1-present Research Assistant, Intelligent Web Laboratory, School of Software, Yunnan University

Concurrent Data Structures

- Surveyed concurrent data structures and published two papers:
  - A general method for developing concurrent structures.
  - A p2p indexing system that utilizes concurrent skiplist.
- Developed the first lock-free Quadtree that achieves tremendous speedup comparing with traditional fine-grained lock versions. Details of the design are included in two technique reports:
  - A review of concurrent techniques in binary search trees.
  - A description and correctness proof of the Quadtree.

Industry Experience

2013.10-2014.2 Research and Develop Intern, Baidu

- Optimized Hadoop workflows that extract thousands of features from raw text files and load them into data warehouses.
- Reference: Jing Li, lijing16@baidu.com

Publications

[1] **Keren, Zhou** ; Guangming, Tan ; Wei, Zhou: Quadboost: A Scalable Concurrent Quadtree. In: *arXiv preprint arXiv:1607.03292* (2016)

[2] Wei, Zhou ; **Keren, Zhou** ; Zhongzhi, Luan ; Shaowen, Yao ; Depei, Qian: Study on Multi-Core Data Structure in Shared-Memory (in Chinese). In: *Journal of Software* (2016), Nr. 4, S. 1009–1025

[3] Zilong, Tan ; **Keren, Zhou** ; Hao, Zhang ; Wei, Zhou: BF-MapReduce: A bloom filter Based Efficient Lightweight Search. In: *International Conference on Collaboration and Internet Computing (CIC) on* IEEE, 2015

[4] Qiang, Li ; Maojie, Gu ; **Keren, Zhou** ; Xiaoming, Sun: Mining User Features for Purchase Prediction in M-Commerce. In: *Data Mining Workshop (ICDMW), 2015 IEEE International Conference on* IEEE, 2015

[5] Wei, Zhou ; Jin, Lu ; **Keren, Zhou** ; Shipu, Wang ; Shaowen, Yao: Concurrent Skiplist Based Double-Layer Index Framework for Cloud Data Processing (in Chinese). In: *Journal of Computer Research and Development* (2015)

[6] **Keren, Zhou** ; Guocheng, Niu ; Wuzhao, Zhang ; Xueqi, Li ; Wenqin, Liu: Parse Concurrent Data Structures: BST as an Example. In: *arXiv preprint arXiv:1505.03759* (2015)

[7] **Keren, Zhou** ; Qian, Yu ; Zhenwei, Zhu ; Wenjia, Liu: Dynamic Vegas: A Competitive Congestion Control Strategy. In: *Proceedings of International Conference on Computer Science and Information Technology* Springer, 2014, S. 333–340

Skills

Languages: C, C++, Java, Python, Bash, Javascript

Parallelism: Pthread, Openmp, MPI, CUDA, SIMD

Awards and Honors

2016 Merit Student of Chinese Academy of Sciences

2016 Schlumberger Scholarship

2015 Top 10, Alibaba 1st Middleware Engineering Contest

2014 Bronze Medal, The 2014 ACM-ICPC Asia Anshan Regional Contest

2014 Outstanding B.E. Degree Thesis of Yunnan University

2013 Best Creative Award, Baidu Future Search Engine Contest

2013 Meritorious Winner, Mathematical Contest in Modeling

2011 Second Prize, China Undergraduate Mathematical Contest in Modeling

2011,2012 National Scholarship

2011,2012 Merit Student of Yunnan Province