ZHANG, Mingxing

Personal Data

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Education

Sep. 2012 - Present	Doctor of Philosophy, Computer Science, Tsinghua University Advisor: Prof. Yongwei Wu
Mar. 2014 - Sep. 2014	Visiting Student, Columbia University Advisor: Prof. Junfeng Yang
Sep. 2008 - Jul. 2012	Bachelor of Science, Computer Science, Beijing University of Post and Telecommunications GPA: 88.8/100.0, Rank: 1/316

Selected Project

- Detecting and Tolerating Concurrency Bugs
  We designed a novel anticipating-based invariant that can detect various types of concurrency bugs. Based on it, we also implemented a software-only tool for tolerating concurrency bugs on-the-fly. Since our tool is not based on roll-back, it can be two order of magnitude faster than previous approaches. This work won an **ACM SIGSOFT Distinguished Paper Award** at 2014.

- Improving the Current Distributed Computing Frameworks
  I'm currently engaged in improving the current distributed computing frameworks. The products include: 1) a fusion-based optimizer that can achieve a speedup up to $5.82\times$; 2) a 3-D graph partitioner that can reduce at most 90.6% of network traffics for certain applications (e.g., ALS); and 3) a set of shrink-based distributed graph algorithms (e.g., our implementation of WCC is about $4\times$ faster than state-of-the-art.

Internship

May. 2015 - Aug. 2015	LLVM at Google Summer of Code 2015 We built a dynamic analysis tool for detecting performance bugs. The tool is implemented by statically instrumenting host applications with LLVM. Several previously unreported bugs are detected by our tool and confirmed by the corresponding developers.
Sep. 2014 - Dec. 2014	Fulltime Intern at Google NYC During this internship, I implemented an automatic test data generation tool for databases. Under Shahan Yang's mentoring, we designed an algorithm that is both query-unaware and coverage-guaranteed. We also explored possible optimizations, such as perturbing the insertion order of BDDs.
May 2013 - Aug. 2013	Developer at MeePoTech MeePo is a distributed file system that focus on providing convenient sharing functionalities. I developed the first version of MeePo's Android client. And I also implemented the userspace filesystem part of MeePo's desktop client, which is based on PyFilesystem.

Aug. 2012 - May 2013	Fulltime Intern at System Research Group, Microsoft Research Asia Under Chuntao Hong's mentoring, I re-wrote Microsoft Search Technology Center's L-BFGS implementation in MPI, which reduces the execution time from 3 days per 40 iterations to less than 3 hours (2TB data in total, 20*16 cores). And I also wrote a MSMPI plugin for YARN. I got an *excellent* assessment for this internship.

Publication List

- Exploring the Hidden Dimension in Graph Processing.
  Mingxing Zhang, Yongwei Wu, Kang Chen, Xuehai Qian, Xue Li, and Weimin Zheng.
  Submitted to OSDI '16.
- RFP: When RPC is Faster than Server-Bypass with RDMA.
  Maomeng Su, **Mingxing Zhang**, Kang Chen, Yongwei Wu, and Weimin Zheng.
  Submitted to SoCC '16.
- Photon: High Performance Graph Processing with Distributed Property Array.
  Pin Gao, **Mingxing Zhang**, Kang Chen, Zhenyu Guo, and Yongwei Wu.
  Submitted to IEEE Transactions on Computers 2016.
- Measuring and Optimizing Distributed Array Programs.
  Mingxing Zhang, Yongwei Wu, Kang Chen, Teng Ma, and Weimin Zheng.
  Proceedings of the 42st International Conference on Very Large Data Bases (**VLDB '16**).
- A Lightweight System for Detecting and Tolerating Concurrency Bugs.
  Mingxing Zhang, Yongwei Wu, Shan Lu, Shanxiang Qi, Jinglei Ren, and Weimin Zheng.
  IEEE Transactions on Software Engineering (**TSE**) 2016.
- What is Wrong With the Transmission? - A Comprehensive Study on Message Passing Related Bugs.
  Mingxing Zhang, Yongwei Wu, Kang Chen, and Weimin Zheng.
  Proceedings of the 44th International Conference on Parallel Processing (**ICPP '15**).
- Fixing, Preventing, and Recovering From Concurrency Bugs.
  *DongDong Deng, GuoLiang Jin, Marc de Kruijf, Ang Li, Ben Liblit, Shan Lu , ShanXiang Qi, JingLei Ren, Karthikeyan Sankaralingam, LinHai Song, YongWei Wu, **MingXing Zhang**, Wei Zhang, WeiMin Zheng.
  Invited Paper in Science China Information Sciences (**SCIS**) 2015.
  * All the authors contributed equally.
- AI: A Lightweight System for Tolerating Concurrency Bugs.
  Mingxing Zhang, Yongwei Wu, Shan Lu, Shanxiang Qi, Jinglei Ren, and Weimin Zheng.
  Proceedings of the 22nd ACM SIGSOFT International Symposium on the Foundations of Software Engineering (**FSE '14**).
  Won ACM SIGSOFT Distinguished Paper Award!

Scholarships and Certificates

2014	ACM SIGSOFT Distinguished Paper Award (at FSE '14)
2013	Award of Excellence, Microsoft Research Asia Internship Program
2015	China National Scholarship for Ph.D. (¥30,000)
2012	Tsinghua Scholarship for Freshmen (¥30,000)
2011 & 2010	China National Scholarship for Undergraduate Student (¥8,000 for each year)
May 2012	36^{th} Place, 2012 ACM-ICPC World Finals.
May 2012	2^{nd} Place, Gold Medal, 2012 ACM-ICPC China Changchun Invitational Programming Contest.
Apr. 2012	4^{th} Place, Gold Medal, 2012 ACM-ICPC China Jinghua Invitational Programming Contest.
Oct. 2011	8^{th} Place, Gold Medal, The 2011 ACM-ICPC Asia Shanghai Regional Contest.
Nov. 2010	9^{th} Place, Gold Medal, The 2010 ACM-ICPC Asia Fuzhou Regional Contest.
May 2010	Gold Medal, 2010 ACM-ICPC China Hangzhou Invitational Programming Contest.
Nov. 2009	Silver Medal, The 2009 ACM-ICPC Asia Harbin Regional Contest.