

Curriculum Vitae

Yujie Liu

Contact Information

19 Memorial Dr W
CSE Department, Packard Lab
Bethlehem, PA 18015

(484)-809-9057
<http://yujieliu.me>
yujie.liu@gmail.com

Research Interests

My research interests lie in the area of concurrent programming, with a focus on designing concurrent objects and synchronization algorithms for shared and/or transactional memory. In general, I am interested in designing correct, efficient, and scalable synchronization mechanisms for practical software and hardware systems.

Education

Ph.D. in Computer Science, Lehigh University	2015
M.Sc. in Computer Science, Lehigh University	2013
B.Eng. in Software Engineering, Tianjin University	2010

Professional Experience

Intern at Scalable Synchronization Research Group, Oracle Labs	06/2013 ~ 08/2013
Intern at Scalable Synchronization Research Group, Oracle Labs	06/2012 ~ 08/2012
Research/Teaching Assistant at CSE Department, Lehigh University	09/2010 ~ 06/2015
Intern at Computing Infrastructure Group, Alibaba Cloud Computing	12/2009 ~ 05/2010

Selected Projects

1. Invented lock-free and wait-free concurrent data structures, including linked lists (DISC 2013), hash tables (PODC 2014), and priority queues (ICPP 2012). Designed specialized synchronization objects to improve scalability of system software (ICDCS 2013).
2. Developed techniques to exploit hardware transactional memory to accelerate nonblocking concurrent data structures (SPAA 2015) and to simplify concurrent programming (PPoPP 2013).
3. Designed and implemented algorithms (TACO 2015, TACO 2013, CGO 2013), runtime systems (SPAA 2014, SPAA 2012), profiling tools, and applications (ASPLOS 2014) for software and hardware transactional memory.
4. Designed and implemented a data-driven parallel processing framework for NUMA machines and distributed clusters (WRSC 2014).
5. Implemented critical components for cloud computing infrastructures, including map-reduce frameworks, transactional key-value storage, and high-level query processing.

Awards and Honors

TRANSACT 2013 Best Application Paper Award	2013
Tianjin University Distinguished Graduate	2010

Refereed Publications

Journal Articles

1. *Transactional Read-Modify-Write Without Aborts*. Wenjia Ruan, Yujie Liu, and Michael Spear. *ACM Transactions on Architecture and Code Optimization (TACO)*. Volume 11 Issue 4, January 2015.
2. *Boosting Timestamp-based Transactional Memory by Exploiting Hardware Cycle Counters*. Wenjia Ruan, Yujie Liu, and Michael Spear. *ACM Transactions on Architecture and Code Optimization (TACO)*. Volume 10 Issue 4, December 2013.

Conference Proceedings

3. *TSXProf: Profiling Hardware Transactions*. Yujie Liu, Justin Gottschlich, Gilles Pokam, and Michael Spear. *24th International Conference on Parallel Architectures and Compilation Techniques (PACT)*. San Francisco, CA, USA, October 2015.
4. *Transactional Acceleration of Concurrent Data Structures*. Yujie Liu, Tingzhe Zhou, and Michael Spear. *27th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*. Portland, OR, USA, June 2015.
5. *Dynamic-Sized Nonblocking Hash Tables*. Yujie Liu, Kunlong Zhang, and Michael Spear. *33rd ACM Symposium on Principles of Distributed Computing (PODC)*. Paris, France, July 2014.
6. *Transaction-Friendly Condition Variables*. Chao Wang, Yujie Liu, and Michael Spear. *26th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*. Prague, Czech Republic, June 2014.
7. *Transactionalizing Legacy Code: An Experience Report Using GCC and Memcached*. Wenjia Ruan, Trilok Vyas, Yujie Liu, and Michael Spear. *19th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*. Salt Lake City, UT, USA, March 2014.
8. *Practical Non-blocking Unordered Lists*. Kunlong Zhang, Yujiao Zhao, Yajun Yang, Yujie Liu, and Michael Spear. *27th International Symposium on Distributed Computing (DISC)*. Jerusalem, Israel, October 2013.
9. *Mindicators: A Scalable Approach to Quiescence*. Yujie Liu, Victor Luchangco, and Michael Spear. *33rd IEEE International Conference on Distributed Computing Systems (ICDCS)*. Philadelphia, PA, USA, July 2013.
10. *Using Hardware Transactional Memory to Correct and Simplify a Readers-Writer Lock Algorithm*. David Dice, Yossi Lev, Yujie Liu, Victor Luchangco, and Mark Moir. *18th ACM Symposium on Principles and Practice of Parallel Programming (PPoPP)*. Shenzhen, China, February 2013.
11. *On the Platform Specificity of STM Instrumentation Mechanisms*. Wenjia Ruan, Yujie Liu, Chao Wang, and Michael Spear. *11th IEEE/ACM International Conference on Code Generation and Optimization (CGO)*. Shenzhen, China, February 2013.
12. *Mounds: Array-Based Concurrent Priority Queues*. Yujie Liu and Michael Spear. *41st International Conference on Parallel Processing (ICPP)*. Pittsburgh, PA, USA, September 2012.
13. *Delegation and Nesting in Best-effort Hardware Transactional Memory*. Yujie Liu, Stephan Diestelhorst, and Michael Spear. *24th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*. Pittsburgh, PA, USA, June 2012.

Workshop Proceedings

14. *Transactional Tools for the Third Decade*. Matthew Kilgore, Stephen Louie, Chao Wang, Tingzhe Zhou, Wenjia Ruan, Yujie Liu, and Michael Spear. *10th ACM Workshop on Transactional Computing (TRANSACT)*. Portland, OR, USA, June 2015.
15. *A New API For Transactional Condition Synchronization*. Chao Wang, Yujie Liu, and Michael Spear. *6th Workshop on the Theory of Transactional Memory (WTTM)*. Paris, France, July 2014.

16. *Towards Whatever-Scale Abstractions for Data-Driven Parallelism*. Tim Harris, Maurice Herlihy, Yossi Lev, Yujie Liu, Victor Luchangco, Virendra Marathe, and Mark Moir. *1st International Workshop on Rack-scale Computing (WRSC)*. Amsterdam, Netherlands, April 2014.
17. *STAMP Need Not Be Considered Harmful*. Wenjia Ruan, Yujie Liu, and Michael Spear. *9th ACM Workshop on Transactional Computing (TRANSACT)*. Salt Lake City, UT, USA, March 2014.
18. *Transaction-Friendly Condition Variables*. Chao Wang, Yujie Liu, and Michael Spear. *9th ACM Workshop on Transactional Computing (TRANSACT)*. Salt Lake City, UT, USA, March 2014.
19. *On the Relationship Between Delaying Operators and Language-Level Semantics*. Wenjia Ruan, Yujie Liu, and Michael Spear. *5th Workshop on the Theory of Transactional Memory (WTTM)*. Jerusalem, Israel, October 2013.
20. *Transactionalizing Legacy Code: An Experience Report Using GCC and Memcached*. Trilok Vyas, Yujie Liu, and Michael Spear. *8th ACM Workshop on Transactional Computing (TRANSACT)*. Houston, TX, USA, March 2013. **Best Application Paper**
21. *Boosting Timestamp-based Transactional Memory by Exploiting Hardware Cycle Counters*. Wenjia Ruan, Yujie Liu, and Michael Spear. *8th ACM Workshop on Transactional Computing (TRANSACT)*. Houston, TX, USA, March 2013.
22. *Toxic Transactions*. Yujie Liu and Michael Spear. *6th ACM Workshop on Transactional Computing (TRANSACT)*. San Jose, CA, USA, June 2011.

Brief Announcements and Posters

23. *A Lock-Free, Array-Based Priority Queue (Poster)*. Yujie Liu and Michael Spear. *17th ACM Symposium on Principles and Practice of Parallel Programming (PPoPP)*. New Orleans, LA, USA, February 2012.
24. *Brief Announcement: A Nonblocking Set Optimized for Querying the Minimum Value*. Yujie Liu and Michael Spear. *30th ACM Symposium on Principles of Distributed Computing (PODC)*. San Jose, CA, USA, June 2011.

Book Chapters

1. *Case Study: Using Transactions in Memcached*. Michael Spear, Wenjia Ruan, Yujie Liu, and Trilok Vyas. *Transactional Memory: Foundations, Algorithms, Tools, and Applications (LNCS 8913)*. January 2015.

Patents Pending

1. *System and Method for Implementing Reader-Writer Locks Using Hardware Transactional Memory*. David Dice, Yosef Lev, Yujie Liu, Victor Luchangco, and Mark Moir. *Pending*. Filed in 2013.

Presentations

1. *Transactional Acceleration of Concurrent Data Structures*. *27th ACM Symposium on Parallelism in Algorithms and Architectures*. Portland, OR, USA. June 2015.
2. *Dynamic-Sized Nonblocking Hash Tables*. *33rd ACM Symposium on Principles of Distributed Computing*. Paris, France. July 2014.
3. *A New API For Transactional Condition Synchronization*. *6th Workshop on the Theory of Transactional Memory*. Paris, France. July 2014.
4. *Transaction-Friendly Condition Variables*. *26th ACM Symposium on Parallelism in Algorithms and Architectures*. Prague, Czech Republic. June 2014.
5. *Practical Non-blocking Unordered Lists*. *27th International Symposium on Distributed Computing*. Jerusalem, Israel. October 2013.
6. *On the Relationship Between Delaying Operators and Language-Level Semantics*. *5th Workshop on the Theory of Transactional Memory*. Jerusalem, Israel. October 2013.

7. *Mindicators: A Scalable Approach to Quiescence*. 33rd IEEE International Conference on Distributed Computing Systems. Philadelphia, PA, USA. July 2013.
8. *Using Hardware Transactional Memory to Correct and Simplify a Readers-Writer Lock Algorithm*. 18th ACM Symposium on Principles and Practice of Parallel Programming. Shenzhen, China. February 2013.
9. *Mounds: Array-Based Concurrent Priority Queues*. 41st International Conference on Parallel Processing. Pittsburgh, PA, USA. September 2012.
10. *Brief Announcement: A Nonblocking Set Optimized for Querying the Minimum Value*. 30th ACM Symposium on Principles of Distributed Computing. San Jose, CA, USA. June 2011.
11. *Toxic Transactions*. 6th ACM Workshop on Transactional Computing. San Jose, CA, USA. June 2011.