

# Xiangyao Yu

## Contact Information

Email: [yxy@mit.edu](mailto:yxy@mit.edu)

Website: <http://people.csail.mit.edu/yxy>

## Address

32-G826, 32 Vassar Street  
Cambridge, MA 02139, U.S.A.

## EDUCATION

### Massachusetts Institute of Technology

Ph.D., Electrical Engineering & Computer Science

Advisor: Srinivas Devadas

February 2015 - September 2017

### Massachusetts Institute of Technology

M.S., Electrical Engineering & Computer Science

Advisor: Srinivas Devadas

September 2012 - February 2015

### Tsinghua University, China

B.S., Microelectronics

September 2008 - August 2012

## PUBLICATIONS

1. **Xiangyao Yu**, Chris Hughes, Nadathur Satish, Onur Mutlu, Srinivas Devadas, “Banshee: Bandwidth-Efficient DRAM Caching via Software/Hardware Cooperation”, Proceedings of the 50th International Symposium on Microarchitecture (**MICRO**), October 2017.
2. **Xiangyao Yu**, “Logical Leases: Scalable Hardware and Software Systems through Time Traveling”, Ph.D. Dissertation, September 2017, **George M. Sprowls Awards for Best PhD Thesis in Computer Science**.
3. **Xiangyao Yu**, Hongzhe Liu, Ethan Zou, Srinivas Devadas, “Tardis 2.0: Optimized Time Traveling Coherence for Relaxed Consistency Models”, Proceedings of the 25th International Conference on Parallel Architectures and Compilation Techniques (**PACT**), September 2016.
4. **Xiangyao Yu**, Andrew Pavlo, Daniel Sanchez, Srinivas Devadas, “TicToc: Time Traveling Optimistic Concurrency Control”, Proceedings of **SIGMOD**, June 2016.
5. Rachata Ausavarungnirun, Chris Fallin, **Xiangyao Yu**, Kevin Chang, Greg Nazario, Reetuparna Das, Gabriel Loh, and Onur Mutlu, “A Case for Hierarchical Rings with Deflection Routing: An Energy-Efficient On-Chip Communication Substrate”, Parallel Computing (**PARCO**), Volume 54, May 2016.
6. **Xiangyao Yu**, Christopher Hughes, Nadathur Satish, Srinivas Devadas, “IMP: Indirect Memory Prefetcher”, Proceedings of the 48th International Symposium on Microarchitecture (**MICRO**), December 2015.
7. **Xiangyao Yu**, Srinivas Devadas, “Tardis: Time Traveling Coherence Algorithm for Distributed Shared Memory”, Proceedings of the 24th International Conference on Parallel Architectures and Compilation Techniques (**PACT**), October 2015. **Best Paper Session**.
8. **Xiangyao Yu**, Syed Kamran Haider, Ling Ren, Christopher Fletcher, Albert Kwon, Marten van Dijk, Srinivas Devadas, “PrORAM: Dynamic Prefetcher for Oblivious RAM”, International Symposium on Computer Architecture (**ISCA**), June 2015.

9. **Xiangyao Yu**, George Bezerra, Andrew Pavlo, Srinivas Devadas, and Michael Stonebraker, “Staring into the Abyss: An Evaluation of Concurrency Control with One Thousand Cores”, Proceedings of the *VLDB* Endowment, vol. 8, iss. 3, November 2014.
10. Rachata Ausavarungnirun, Chris Fallin, **Xiangyao Yu**, Kevin Chang, Greg Nazario, Reetuparna Das, Gabriel Loh, and Onur Mutlu, “Design and Evaluation of Hierarchical Rings with Deflection Routing”, Proceedings of the 26th International Symposium on Computer Architecture and High Performance Computing (*SBAC-PAD*), October 2014.
11. Christopher Fletcher, Ling Ren, **Xiangyao Yu**, Marten van Dijk, Omer Khan, and Srinivas Devadas, “Suppressing the Oblivious RAM Timing Channel While Making Information Leakage and Program Efficiency Trade-offs”, Proceedings of the International Symposium on High Performance Computer Architecture (*HPCA*), February 2014.
12. **Xiangyao Yu**, Christopher Fletcher, Ling Ren, Marten Van Dijk, and Srinivas Devadas, “Generalized External Interaction with Tamper-Resistant Hardware with Bounded Information Leakage”, Proceedings of the Cloud Computing Security Workshop (*CCSW*), November 2013
13. Emil Stefanov, Marten van Dijk, Elaine Shi, Christopher Fletcher, Ling Ren, **Xiangyao Yu**, and Srinivas Devadas, “Path ORAM: An Extremely Simple Oblivious RAM Protocol”, Proceedings of the 20th Computer and Communication Security Conference (*CCS*), 2013. **Best Student Paper Award.**
14. Ling Ren, Christopher W. Fletcher, **Xiangyao Yu**, Marten van Dijk, and Srinivas Devadas, “Integrity Verification for Path Oblivious-RAM”, Proceedings of the 17th IEEE High Performance Extreme Computing Conference (*HPEC*), 2013
15. Ling Ren, **Xiangyao Yu**, Christopher W. Fletcher, Marten van Dijk, Srinivas Devadas, “Design Space Exploration and Optimization of Path Oblivious RAM in Secure Processors”, 40th International Symposium on Computer Architecture (*ISCA*), 2013
16. Yuan Lin Yeoh, Bo Wang, **Xiangyao Yu**, Tony Tae Hyoung Kim, “A 0.4V 7T SRAM with Write Through Virtual Ground and Ultra-fine Grain Power Gating Switches.” IEEE International Symposium on Circuits and Systems (*ISCAS*), 2013
17. Chris Fallin, Greg Nazario, **Xiangyao Yu**, Kevin Chang, Rachata Ausavarungnirun, Onur Mutlu. “MinBD: Minimally- Buffered Deflection Routing for Energy-Efficient Interconnect.” In 6th ACM/IEEE International Symposium on Networks-on-Chip (*NOCS*), 2012.

## TALKS

### **Banshee: Bandwidth-Efficient DRAM Caching via Software/Hardware Cooperation**

1. Conference talk at MICRO, Cambridge, MA, 2017

### **Logical Leases: Scalable Hardware and Software Systems through Time Traveling**

1. QCRI, Qatar, January 2018
2. SJTU, January 2018
3. MIT PhD defense, September 2017
4. Georgia Institute of Technology, March 2017
5. University at Buffalo, February 2017
6. MongoDB, New York, NY, January 2017

### **Tardis 2.0: Optimized Time Traveling Coherence for Relaxed Consistency Models**

1. Conference talk at PACT, Haifa, Israel, September 2016

### **TicToc: Time Traveling Optimistic Concurrency Control**

1. Intel Science and Technology Center for Big Data (ISTC-BD),
2. Conference talk at SIGMOD, San Francisco, CA, June 2016 Hillsboro, OR, August 2016
3. Huawei, Santa Clara, CA, June 2016
4. North East Database Day (NEDB), MIT, January 2016

### **Time Traveling Cache Coherence and Concurrency Control**

1. Intel, Santa Clara, CA, June 2016
2. Huawei, Santa Clara, CA, June 2016
3. Brown University, February 2016
4. Harvard University, February 2016
5. University of Massachusetts, Amherst, February 2016

### **IMP: Indirect Memory Prefetcher**

1. Conference talk at MICRO, Honolulu, HI, December 2015
2. Intel, Santa Clara, CA, August 2014
3. Intel Science and Technology Center for Big Data (ISTC-BD), Hillsboro, OR, August 2014

### **Tardis: Time Traveling Coherence Algorithm for Distributed Shared Memory**

1. Conference talk at PACT, San Francisco, CA, October 2015

### **Staring into the Abyss: An Evaluation of Concurrency Control with One Thousand Cores**

1. Alibaba, Hangzhou, January 2018
2. Conference talk at VLDB, Kohala Coast, HI, September 2015
3. MIT cloud workshop, MIT, September 2014
4. CSAIL Alliance Program (CAP) annual meeting, MIT, May 2014
5. Poster at New England Database Day (NEDB), MIT, January 2014
6. Poster at Intel Science and Technology Center for Big Data (ISTC-BD), Santa Clara, CA, December 2013

### **Generalized External Interaction with Tamper-Resistant Hardware with Bounded Information Leakage**

1. Conference talk at CCSW, Berlin, Germany, November 2013

### **Design Space Exploration and Optimization of Path Oblivious RAM in Secure Processors**

1. IBM China Research Lab, Beijing, China, August 2013
2. Conference talk at ISCA, Tel-Aviv, Israel, June 2013

## TEACHING

### MIT, 6.004 Computation Structures

Teaching Assistant

Fall 2016

Instructors: Chris Terman, Silvina Hanono Wachman

### MIT, 6.046/18.410 Design and Analysis of Algorithms

Teaching Assistant

Spring 2015

Instructors: Erik Demaine, Srinu Devadas, Nancy Lynch

## WORK EXPERIENCE

### Parallel Computing Lab, Intel

Jun 2014 - Aug 2014

*full-time intern*, Manager: Dr. Pradeep Dubey

Project: Graph algorithm scalability

### Mobile And Sensing System Group, Microsoft Research Asia

Oct 2011 - Jun 2012

*full-time intern*, Mentor: Dr. Thomas Moscibroda

Project: Task scheduling on mobile phone, service allocation in datacenter

### ECE, Carnegie Mellon University

Jun 2011 - Sep 2011

*research summer intern*, Advisor: Dr. Onur Mutlu

Project: Energy-efficient hierarchical ring on-chip interconnect

### Hulu, Beijing

Aug 2009 - Feb 2010

*part-time intern*, Manager: Dr. Zhibing Wang

Project: Search tracking service

## PATENTS

### Hardware prefetcher for indirect access patterns

Xiangyao Yu, Christopher J. Hughes, Nadathur Rajagopalan Satish

US 20160188476

### Service Allocation in a Distributed Computing Platform

Thomas Moscibroda, Zhengping Qian, Mark Eugene Russinovich, Xiangyao Yu, Jiaying Zhang, Feng Zhao

US 20160188476

## HONORS

1. George M. Sprowls Award for outstanding Ph.D. thesis in CS at MIT November 2017
2. Presented in the best paper session in PACT 2015 October 2015
3. CCS13 Best Student Paper Award November 2013
4. Energy initiative fellowship 2012 - 2013
5. Graduation with honors from Tsinghua University June 2012
6. 1st class prize for scientific research at Tsinghua University September 2010
7. 1st prize in 28th Challenge Cup at Tsinghua University April 2010
8. Comprehensive scholarship 2009 - 2012

9. 3rd prize in 21st International Young Physicists' Tournament (IYPT)

June 2008