Curriculum Vitae

Shan Lu

University of Chicago, Dept. of Computer Science
5730 S. Ellis Ave., Room 343
Chicago, IL 60637 USA

Phone: +1-773-702-3184
E-mail: shanlu@uchicago.edu
Homepage: http://people.cs.uchicago.edu/~shanlu

RESEARCH INTERESTS

Providing tool support for improving the reliability and efficiency of large scale software systems

EMPLOYMENT

Associate Professor, August 2014 -- present
Department of Computer Sciences, University of Chicago

Assistant Professor, January 2009 – July 2014
Department of Computer Sciences, University of Wisconsin – Madison

EDUCATION

University of Illinois at Urbana-Champaign, Urbana, IL
Ph.D. in Computer Science, 2008
Thesis: Understanding, Detecting, and Exposing Concurrency Bugs (Advisor: Prof. Yuanyuan Zhou)

University of Science & Technology of China, Hefei, China
B.S. in Computer Science, 2003

HONORS AND AWARDS

- **Google Scholar Classic Papers**, Software Systems Track, 2017

"CP-Miner: finding copy-paste and related bugs in large-scale software code" published in IEEE-TSE 2006
Top 10 most cited software systems papers published in 2006 based on Google Scholar

- **Best Paper Award**, USENIX OSDI 2016

"Early Detection of Configuration Errors to Reduce Failure Damage" published in OSDI'16
Top 3 papers selected from 267 OSDI'16 submissions

- **Google Faculty Research Award**, 2015
- **ACM SIGSOFT Distinguished Paper Award**, 2015

"CARAMEL: Detecting and Fixing Performance Problems That Have Non-Intrusive Fixes" published in ICSE'15
Top 6 papers selected from 452 ICSE'15 submissions

- **Distinguished referee of ACM Transactions on Software Engineering and Methodology**, 2013--2014
- **ACM SIGSOFT Distinguished Paper Award**, 2014

"AI: a Lightweight System for Tolerating Concurrency Bugs" published in FSE'14
Top 6 papers selected from 280 FSE'14 submissions

- **Alfred P. Sloan Research Fellow**, 2014

Among 126 "early-career scholars (who) represent the most promising scientific researchers working today" selected by Alfred P. Sloan Foundation in 2014

- **Distinguished Alumni Educator Award**, 2013

Among 3 awardees selected by Department of Computer Science, University of Illinois

- **Best Paper Award**, USENIX FAST 2013

"A Study of Linux File System Evolution" published in FAST'13
Top 2 papers selected from 127 FAST'13 submissions

- **ACM SIGPLAN Research Highlights**, 2011

"Automated Atomicity-Violation Fixing" published in PLDI'11

Top 8 papers selected from all papers published in 13 SIGPLAN sponsored conferences in 2011 for "high quality and broad appeal"

- **NSF Career Award**, 2010
- **IEEE Micro Top Picks in Computer Architecture**, 2006

"AVIO: Detecting Atomicity Violations via Access-Interleaving Invariants" published in ASPLOS'06
Top 11 papers selected from all papers published in computer architecture conferences in 2006

RESEARCH AND CREATIVE SCHOLARSHIP[1]

Refereed Conference Papers

2018

C55. Ting Dai, Jingzhu He, Xiaohui Gu, Shan Lu, and Peipei Wang, "DScope: Detecting Real-World Data Corruption Hang Bugs in Cloud Server Applications", ACM Symposium on Cloud Computing (**SoCC**), November 2018.
Acceptance Rate: 24.3%, 39 out of 160.

C54. Junwen Yang[S], Cong Yan, Pranav Subramaniam[S], Shan Lu, and Alvin Cheung, "PowerStation: Automatically detecting and fixing inefficiencies of database-backed web applications in IDE", 32nd ACM SIGSOFT International Symposium on the Foundations of Software Engineering (**FSE**) [Demo-Track], November 2018.
Acceptance Rate: 38.8%, 14 out of 36.

C53. Yuxi Chen[S] , Shu Wang[S], Shan Lu, Karthikeyan Sankaralingam, "Applying Hardware Transactional Memory for Concurrency-Bug Failure Recovery in Production Runs", USENIX Annual Technical Conference (**USENIX ATC**), July 2018.
Acceptance Rate: 20.1%, 76 out of 378.

C52. Jiaxin Li[S], Yuxi Chen[S], Haopeng Liu[S], Shan Lu, Yiming Zhang, Haryadi Gunawi, Xiaohui Gu, Dongsheng Li, and Xicheng Lu, "PCatch: Automatically Detecting Performance Cascading Bugs in Cloud Systems", EuroSys (**EuroSys**), April 2018.
Acceptance Rate: 16.4%, 43 out of 262.

C51. Junwen Yang[S], Cong Yan, Pranav Subramaniam[S], Shan Lu, and Alvin Cheung, "A Comprehensive Study and Discovery of Performance Problems in Database-Backed Web Applications", The 40th International Conference on Software Engineering (**ICSE**), May 2018.
Acceptance Rate: 20.9%, 105 out of 502.
Featured on "a morning paper" and "Hacker News"

C50. Haopeng Liu[S], Xu Wang, Guangpu Li[S], Shan Lu, Feng Ye, and Chen Tian, "FCatch: Automatically Detecting Time-of-Fault Bugs in Cloud Systems", 23nd International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2018.
Acceptance Rate: 18.2%, 56 out of 307

C49. Shu Wang[S], Chi Li[S], William Sentosa[S], Henry Hoffmann, and Shan Lu, "Understanding and Auto-Adjusting Performance-Sensitive Configurations", 23nd International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2018.
Acceptance Rate: 18.2%, 56 out of 307

[1] Students directly under my supervision are denoted by "S"

C48. Khanh Nguyen, Lu Fang, Christian Navasca, Guoqing Harry Xu, Brian Demsky, and Shan Lu, "Skyway: Connecting Managed Heaps in Distributed Big Data Systems", 23nd International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2018.
Acceptance Rate: 18.2%, 56 out of 307.
Featured on "a morning paper"

C47. Ting Dai, Jingzhu He, Xiaohui Gu, and Shan Lu, "Understanding Real-World Timeout Problems in Cloud Server Programs", IEEE International Conference on Cloud Engineering (**IC2E**), April 2018.
Acceptance Rate: 19.0%, 12 out of 63. ***Nominated for Best Paper Award***

2017

C46. Cong Yan, Junwen Yang[S], Alvin Cheung, and Shan Lu, "Understanding Database Performance Inefficiencies in Real-World Web Applications", ACM International Conference on Information and Knowledge Management, November 2017 (**CIKM**)
Acceptance Rate: 21%, 171 out of 820.

C45. Linhai Song[S], and Shan Lu, "Performance Diagnosis for Inefficient Loops", The 39th International Conference on Software Engineering (**ICSE**), May 2017.
Acceptance Rate: 16.4%, 68 out of 415.

C44. Ankit Choudhary, Shan Lu, and Michael Pradel, "Efficient Detection of Thread Safety Violations via Coverage-Guided Generation of Concurrent Tests", The 39th International Conference on Software Engineering (**ICSE**), May 2017.
Acceptance Rate: 16.4%, 68 out of 415.

C43. Haopeng Liu[S], Guangpu Li[S], Jeffrey F. Lukman, Jiaxin Li[S], Shan Lu, Haryadi S. Gunawi, and Chen Tian, "DCatch: Automatically Detecting Distributed Concurrency Bugs in Cloud Systems", 22nd International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), April 2017.
Acceptance Rate: 17.4%, 56 out of 321

2016

C42. Zhiqiang Zuo, Lu Fang, Siau Cheng Khoo, Harry Xu, and Shan Lu, "Low-Overhead and Fully Automated Statistical Debugging with Abstraction Refinement", ACM International Conference on Object Oriented Programming Systems Languages and Applications (**OOPSLA**), November 2016.
Acceptance Rate: 25.6%, 52 out of 203.

C41. Tianyin Xu, Xinxin Jin, Peng Huang, Yuanyuan Zhou, Shan Lu, Long Jin, Shankar Pasupathy, "Early Detection of Configuration Errors to Reduce Failure Damage", 12th USENIX Symposium on Operating Systems Design and Implementation (**OSDI**), November 2016.
Acceptance Rate: 17.6%, 47 out of 267.
Best Paper Award. Featured on "a morning paper"

C40. Khanh Nguyen, Lu Fang, Guoqing (Harry) Xu, Brian Demsky, Shan Lu, Sanazsadat Alamian, Onur Mutlu, "Yak: A High-Performance Big-Data-Friendly Garbage Collector", 12th USENIX Symposium on Operating Systems Design and Implementation (**OSDI**), November 2016.
Acceptance Rate: 17.6%, 47 out of 267.

C39. Haopeng Liu[S], Yuxi Chen[S], and Shan Lu, "Understanding and Generating High Quality Patches for Concurrency Bugs", ACM SIGSOFT International Sympsium on the Foundations of Software Engineering (**FSE**), November 2016.
Acceptance Rate: 27.1%, 74 out of 273.

C38. Jeffrey F. Lukman, Tanakorn Leesatapornwongsa, Shan Lu, and Haryadi S. Gunawi, "TaxDC: A Taxonomy of Concurrency Bugs in Datacenter Distributed Systems", 21st International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), April 2016.
Acceptance Rate: 22.1%, 53 out of 240.

2015

C37. Lu Fang, Khanh Nguyen, Guoqing (Harry) Xu, Brian Demsky, and Shan Lu, "Interruptable Tasks: Treating Memory Pressure As Interrupts for Highly Scalable Data-Parallel Programs", 25th ACM Symposium on Operating Systems Principles (**SOSP**), October 2015.
Acceptance Rate: 16.1%, 30 out of 186.

C36. Rui Gu[S], Guoliang Jin[S], Linhai Song[S], Linjie Zhu[S], and Shan Lu, "What Change History Tells Us About Thread Synchronization", 29th ACM SIGSOFT International Symposium on the Foundations of Software Engineering (**FSE**), August 2015.
Acceptance Rate: 25.4%, 74 out of 291.

C35. Adrian Nistor[S], Po-Chun Chang[S], Cosmin Rădoi, and Shan Lu, "CARAMEL: Detecting and Fixing Performance Problems That Have Non-Intrusive Fixes", The 37th International Conference on Software Engineering (ICSE), May 2015.
Acceptance Rate: 18.5%, 84 out of 452.
Won SIGSOFT Distinguished Paper Award.

2014

C34. Mingxing Zhang, Yongwei Wu, Shan Lu, Shanxiang Qi, Jinglei Ren, and Weimin Zheng, "AI: a Lightweight System for Tolerating Concurrency Bugs", 28th ACM SIGSOFT International Symposium on the Foundations of Software Engineering (**FSE**), November 2014.
Acceptance Rate: 22.3%, 61 out of 273.
Won SIGSOFT Distinguished Paper Award.

C33. Linhai Song[S] and Shan Lu, "Statistical Debugging for Real-World Performance Problems", International Conference on Object-Oriented Programming, Systems, Languages & Applications (**OOPSLA**), October 2014.
Acceptance Rate: 28.4%, 53 out of 186.

C32. Joy Arulraj[S], Guoliang Jin[S], and Shan Lu, "Leveraging the Short-Term Memory of Hardware to Diagnose Production-Run Software Failures", 19th International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2014.
Acceptance Rate: 22.6%, 49 out of 217.

2013

C31. Dongdong Deng[S], Wei Zhang[S], and Shan Lu, "Efficient Concurrency-Bug Detection Across Inputs", International Conference on Object-Oriented Programming, Systems, Languages & Applications (**OOPSLA**), October 2013.
Acceptance Rate: 26.4%, 50 out of 189

C30. William Harris, Guoliang Jin[S], Shan Lu, and Somesh Jha, "Validating Library Usage Interactively", 25th International Conference on Computer Aided Verification (**CAV**), July 2013.

C29. Lanyue Lu, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, and Shan Lu, "A Study of Linux File System Evolution", 11th USENIX Conference on File and Storage Technologies (**FAST**), February 2013.
Acceptance Rate: 18.9%, 24 out of 127;
Best Paper Award

C28. Adrian Nistor[S], Linhai Song[S], Darko Marinov, and Shan Lu, "Toddler: Detecting Performance Problems via Similar Memory-Access Patterns", 35th International Conference on Software Engineering (**ICSE**), May 2013.
Acceptance Rate: 18.5%, 85 out of 461

C27. Joy Arulraj[S], Po-Chun Chang[S], Guoliang Jin[S], and Shan Lu, "Production-Run Software Failure Diagnosis via Hardware Performance Counters", 18th International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2013.
Acceptance Rate: 22.7%, 44 out of 193

C26. Wei Zhang[S], Marc de Kruijf, Ang Li[S], Shan Lu, and Karthikeyan Sankaralingam, "ConAir: Featherweight Concurrency Bug Recovery Via Single-Threaded Idempotent Execution", 18th International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2013.
Acceptance Rate: 22.7%, 44 out of 193

2012

C25. Guoliang Jin[S], Wei Zhang[S], Dongdong Deng[S], Shan Lu, and Ben Liblit, "Automated Concurrency-Bug Fixing", USENIX Symposium on Operating Systems Design and Implementation (**OSDI**), October 2012.
Acceptance Rate: 11.6%, 25 out of 215

C24. Guoliang Jin[S], Linhai Song[S], Xiaoming Shi[S], Joel Scherpelz[S], and Shan Lu, "Understanding and Detecting Real-World Performance Bugs", Programming Language Design and Implementation (**PLDI**), June 2012.
Acceptance Rate: 18.8%, 48 out of 255

C23. Haris Volos, Andres Jaan Tack, Michael Swift, Shan Lu "Applying Transactional Memory to Concurrency Bugs", 17th International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2012.
Acceptance Rate: 21.5%, 37 out of 172

2011

C22. Guoliang Jin[S], Linhai Song[S], Wei Zhang[S], Shan Lu, Ben Liblit, "Automated Atomicity-Violation Fixing", Programming Language Design and Implementation (**PLDI**), June 2011.
Acceptance Rate: 23.3%, 55 out of 236
ACM SIGPLAN Research Highlights Award

C21. Wei Zhang[S], Junghee Lim, Ramya Olichandran[S], Joel Scherpelz[S], Guoliang Jin[S], Shan Lu, Thomas Reps, "ConSeq: Detecting Concurrency Bugs through Sequential Errors", 16th International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2011.
Acceptance Rate: 21.0%, 32 out of 152

2010

C20. Guoliang Jin[S], Aditya Thakur, Ben Liblit, Shan Lu, "Instrumentation and Sampling Strategies for Cooperative Concurrency Bug Isolation", International Conference on Object-Oriented Programming, Systems, Languages & Applications (**OOPSLA**), October 2010.
Acceptance Rate: 27%, 45 out of 164

C19. Yao Shi, Soyeon Park, Zuoning Yin, Shan Lu, Yuanyuan Zhou, Wenguang Chen, Weimin Zheng, "Do I Use the Wrong Definition? DefUse: Definition-Use Invariants for Detecting Concurrency and Sequential Bugs", International Conference on Object-Oriented Programming, Systems, Languages & Applications (**OOPSLA**), October 2010.
Acceptance Rate: 27%, 45 out of 164

C18. YadiMa, Suman Banerjee, Shan Lu, Cristian Estan, "Leveraging Parallelism forMulti-dimensional Packet Classification on Software Routers", ACM SIGMETRICS 2010 International Conference on Measurement and Modeling of Computer Systems (**SIGMETRICS**), June 2010.
Acceptance Rate: 16%, 29 out of 184

C17. Wei Zhang[S], Chong Sun[S], Shan Lu, "ConMem: Detecting Severe Concurrency Bugs through an Effect-Oriented Approach", 15th International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2010.
Acceptance Rate: 17.7%, 32 out of 181

2009

C16. Soyeon Park, Weiwei Xiong, Zuoning Yin, Rini Kaushik, Kyu H. Lee, Shan Lu, Yuanyuan Zhou, "Do You Have to Reproduce the Bug at the First Replay Attempt? – PRES: Probabilistic Replay with Execution Sketching on Multiprocessors", 22nd ACM Symposium on Operating Systems Principles (**SOSP**), October 2009.
Acceptance Rate: 16.4%, 23 out of 140

C15. Soyeon Park, Shan Lu, Yuanyuan Zhou, "CTrigger: Exposing Atomicity Violation Bugs from Their Hiding Places", 14th International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2009.
Acceptance Rate: 25.7%, 29 out of 113

2008

C14. Shan Lu, Soyeon Park, Eunsoo Seo, Yuanyuan Zhou, "Learning from mistakes — a comprehensive study of real world concurrency bug characteristics", 13th International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2008.

2007

C13. Shan Lu, Soyeon Park, Chongfeng Hu, Xiao Ma, Weihang Jiang, Zhenmin Li, Raluca Popa, Yuanyuan Zhou, "MUVI: Automatically Inferring Multi-Variable Access Correlations and Detecting Related Semantic and Concurrency Bugs", 21st ACM Symposium on Operating Systems Principles (**SOSP**), October 2007.

C12. Joseph Tucek, Shan Lu, Chengdu Huang, Spiros Xanthos, and Yuanyuan Zhou, "Triage: Diagnosing Production Run Failures at the User's Site", 21st ACM Symposium on Operating Systems Principles (**SOSP**), October 2007.

C11. Shan Lu, Weihang Jiang and Yuanyuan Zhou, "A Study of Interleaving Coverage Criteria", 15th ACM SIGSOFT Symposium on the Foundations of Software Engineering (**FSE**) (short paper), September 2007.

C10. Joseph Tucek, James Newsome, Shan Lu, Chengdu Huang, Spiros Xanthos, David Brumley, Yuanyuan Zhou and Dawn Song, "Sweeper: A Lightweight End-to-end System for Defending Against Fast Worms", 2nd ACM SIGOPS EuroSys (**EuroSys**), March 2007.

2006

C9. Shan Lu, Pin Zhou, Wei Liu, Yuanyuan Zhou, Josep Torrellas, "PathExpander: Architectural Support for Increasing the Path Coverage of Dynamic Bug Detection", 39th Annual IEEE/ACM International Symposium on Microarchitecture (**MICRO**), December 2006.

C8. Shan Lu, Joe Tucek, Feng Qin, and Yuanyuan Zhou, "AVIO: Detecting Atomicity Violations via Access-Interleaving Invariants", 12th International Conference on Architecture Support for Programming Languages and Operating Systems (**ASPLOS**), October 2006.
IEEE Micro Top Picks Award

C7. Chad Verbowski, Emre Kiciman, Arunvijay Kumar, and Brad Daniels, Shan Lu, Juhan Lee, Yi-Min Wang, Roussi Roussev. "Flight Data Recorder: Monitoring Persistent-State Interactions to Improve Systems Management", 7th Symposium on Operating System Design and Implementation (**OSDI**), November 2006.

C6. Chad Verbowski, Brad Daniels, Emre Kiciman, Shan Lu, Roussi Roussev, Yi-Min Wang and Juhan Lee. "Analyzing Persistent State Interactions to Improve State Management", Joint International Conference on Measurement and Modeling of Computer Systems (**SIGMETRICS**) (short paper), June 2006.

2005

C5. Feng Qin, Shan Lu and Yuanyuan Zhou, "SafeMem: Exploiting ECC-Memory for Detecting Memory Leaks and Memory Corruption During Production Runs", 10th International Symposium on High-Performance Computer Architecture (**HPCA**), February 2005.

2004

C4. Zhenmin Li, Shan Lu, Suvda Myagmar and Yuanyuan Zhou, "CP-Miner: A Tool for Finding Copy-paste and Related Bugs in Operating System Code", 6th Symposium on Operating System Design and Implementation (**OSDI**), December 2004.

C3. Pin Zhou, Wei Liu, Long Fei, Shan Lu, Feng Qin, Yuanyuan Zhou, Samuel Midkiff and Josep Torrellas, "AccMon: Automatically Detecting Memory-related Bugs via Program Counter-based Invariants", 37th Annual IEEE/ACM International Symposium on Micro-architecture (**MICRO**), December 2004.

C2. Keman Yu, Shan Lu, Jiang Li and Shipeng Li, "Half-pixel Motion Estimation Bypass Based on a Linear Model", 24th Picture Coding Symposium (**PCS**), December 2004.

2003

C1. Shan Lu, Keman Yu, Jiang Li and Shipeng Li, "A Low Complexity 2-Power Transform for Video Compression", 4th International Conference on Information, Communications & Signal Processing (**ICICSP**), December 2003.

Journal Articles

J9. Ting Dai, Daniel Dean, Peipei Wang, Xiaohui Gu, Shan Lu, "*Hytrace: A Hybrid Approach to Performance Bug Diagnosis in Production Cloud Infrastructures*", IEEE Transactions on Parallel and Distributed Systems (**TPDS**), 2018.

J8. Mingxing Zhang, Yongwei Wu, Shan Lu, Shanxiang Qi, Jinglei Ren, Weimin Zheng, "A Lightweight System for Detecting and Tolerating Concurrency Bugs", IEEE Transactions on Software Engineering (**TSE**), 2016.

J7. DongDong Deng[S], GuoLiang Jin[S], Marc de Kruijf, Ang Li[S], Ben Liblit, Shan Lu, ShanXiang Qi, JingLei Ren, Karthikeyan Sankaralingam, LinHai Song[S], YongWei Wu, MingXing Zhang, Wei Zhang[S], WeiMin Zheng, "Fixing, preventing, and recovering from concurrency bugs", Science China Information Sciences, April 2015.

J6. Lanyue Lu, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, and Shan Lu, "A Study of Linux File System Evolution, ACM Transactions on Storage (**ACM-TOS**), Volume 10, Issue 1, 2014.

J5. Wei Zhang[S], Chong Sun[S], Junghee Lim, Shan Lu, and Thomas Reps, "ConMem: Detecting Crash-Triggering Concurrency Bugs through an Effect-Oriented Approach", ACM Transactions on Software Engineering and Methodology (**ACM-TOSEM**), Volume 22, Issue 2, 2013.

J4. Shan Lu, Soyeon Park, and Yuanyuan Zhou, "Detecting Concurrency Bugs From the Perspectives of Synchronization Intentions", IEEE Transactions on Parallel and Distributed Systems (**IEEE-TPDS**), Volume 23, Issue 6, 2012.

J3. Shan Lu, Soyeon Park, and Yuanyuan Zhou, "Finding Atomicity-Violation Bugs Through Unserializable Interleaving Testing", IEEE Transactions on Software Engineering (**IEEE-TSE**), Volume 38, Issue 4, 2011.

J2. Shan Lu, Joe Tucek, Feng Qin, and Yuanyuan Zhou, "AVIO: Detecting Atomicity Violations via Access-Interleaving Invariants", **IEEE Micro** Special Issue: Top Picks from Computer Architecture Conferences, January-February 2007 Issue.

J1. Zhenmin Li, Shan Lu, Suvda Myagmar and Yuanyuan Zhou, "CP-Miner: finding copy-paste and related bugs in large-scale software code", IEEE Transactions on Software Engineering (**IEEE-TSE**), April 2006.

Workshop Papers

W6. Dongdong Deng[S], Wei Zhang[S], Borui Wang[S], Peisen Zhao[S], and Shan Lu, "Understanding the Interleaving Space Overlap across Inputs and Software Versions", USENIX Workshop on Hot Topics in Parallelism (**HotPar**), June 2012.

W5. Joel Scherpelz[S], and Shan Lu, "Lessons from performance bugs for performance evaluation", Workshop on Experimental Evaluation of Software and Systems in Computer Science, October 2010.

W4. Aditya Thakur, Rathijit Sen, Ben Liblit, and Shan Lu, "Cooperative Crug Isolation", 7th International Workshop on Dynamic Analysis (**WODA**), July 2009.

W3. Joseph Tucek, Shan Lu, Chengdu Huang, Spiros Xanthos, Yuanyuan Zhou, "Automatic Online Failure Diagnosis at the End-User Site", 2nd Workshop on Hot Topics in System Dependability (**HotDep**), November 2006.

W2. Zhenmin Li, Lin Tan, Xuanhui Wang, Shan Lu, Yuanyuan Zhou and Chengxiang Zhai, "Have Things Changed Now? – An Empirical Study of Bug Characteristics in Modern Open Source Software", 1st Workshop on Architectural and System Support for Improving Software Dependability (**ASID**), October 2006.

W1. Shan Lu, Zhenmin Li, Feng Qin, Lin Tan, Pin Zhou and Yuanyuan Zhou, "BugBench: A Benchmark for Evaluating Bug Detection Tools", Workshop on the Evaluation of Software Defect Detection Tools (**Bug**), June 2005.

Magazine Articles

M2. Lanyue Lu, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, and Shan Lu, "A Study of Linux File System Evolution", ;login: The USENIX Magazine (**;login:**) , Volume 38, Number 3, June 2013.

M1. Shan Lu, "Challenges and Opportunities in Fighting Concurrency Bugs in Multi-threaded Software", Communications of the China Computer Federation (**CCCF**), February 2013.

Patents

P3. Yuanyuan Zhou, Shan Lu, and Joseph Andrew Tucek, "Atomicity Violation Detection Using Access Interleaving Invariants", U.S. patent No. 8533681, Sep. 10th, 2013. (**Licensed to Intel**)

P2. Brad Daniels, John Dunagan, Arunvijay Kumar, Juhan Lee, Shan Lu, Roussi Roussev, Chad Verbowski, "Thread Interception and Analysis", U.S. patent No. 7865777, Jan. 4th, 2011.

P1. Shan Lu, Keman Yu, Jiang Li, and Shipeng Li, "Low-complexity 2-power transform for image/video compression", U.S. Patent No. 7379500, May 27th, 2008.

Systems Released

S1. BugBench, a benchmark for software bug detection, released to more than 70 research groups.
S2. AVIO, a concurrency bug detection tool, licensed to Intel.

PROFESSIONAL SERVICE

Professional Society Service

ACM SIGOPS Vice Chair, 7/2015 – present
ACM Transactions on Computer Systems Editor-in-Chief Search Committee Chair, 2018
ACM SIGOPS Information Director, 8/2013 – 6/2015
ACM SIGSOFT Dissertation Award Committee, 2013

Conference Chairing & Steering Committee Service

Steering Committee Member for Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), 2016 – present
Steering Committee Member for Workshop on Hot Topics in Operating Systems (**HotOS**), 2016 -- present
Chair for USENIX Annual Technical Conference, 2015

Journal Editorship

Associate Editor for IEEE Computer Architecture Letters (CAL), 2016 --present

Other Conference & Workshop Organization Service

Chair for ACM Asia-Pacific Workshop on Systems (**APSys**), 2018
Co-Organizer for Diversity Workshop at SOSP, 2017
Sponsorship Chair for SOSP, 2017
Chair for 8th Workshop on Programming Languages and Operating Systems (PLOS), 2015
Chair for ACM Student Research Competition at ICS, 2011

Conference Program Committee Service (selected)

ACM Symposium on Operating Systems Principles (**SOSP**), 2017, 2015, 2013
USENIX Symposium on Operating Systems Design and Implementation (**OSDI**), 2016, 2012, 2010
ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI**), 2017, 2015, 2013
International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), 2019, 2018, 2017, 2014
International Conference on Object-Oriented Programming, Systems, Languages, and Applications (**OOPSLA**), 2014
EuroSys, 2013
IEEE/IFIP International Conference on Dependable Systems and Networks (**DSN**), 2013
International Conference on Runtime Verification (**RV**), 2012
USENIX Annual Technical Conference (**USENIX ATC**), 2014, 2010

Conference Reviewer Service (selected)

ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI**), 2014, 2008
USENIX Symposium on Operating Systems Design and Implementation (**OSDI**), 2014
International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), 2016, 2013, 2010
International Symposium on Computer Architecture (**ISCA**), 2014, 2013, 2012, 2009
International Symposium on Microarchitecture (**Micro**), 2013, 2012, 2011, 2007
IEEE International Symposium on High-Performance Computer Architecture (**HPCA**), 2013, 2014

Funding Proposal Review Service

National Science Foundation, 2014, 2015, 2016, 2017, 2018
Natural Sciences and Engineering Research Council of Canada (NSERC), 2012
U.S.-Israel Binational Science Foundation, 2010

TEACHING

Courses Taught In University of Chicago

Course#	Course Title	Quarters
CS 331	Advanced Operating Systems	2014 Winter, 2015 Fall, 2016 Fall, 2017 Fall
CS 220	Software Construction	2014 Fall, 2016 Spring, 2017 Winter, 2018 Winter

Courses Taught In University of Wisconsin

Term	Year	Course#	Course Title	Size	Evaluation
Spring	2014	CS 537	Introduction to Operating Systems	49	4.60 out of 5
Fall	2013	CS 739	Distributed Systems	31	4.38 out of 5
Fall	2012	CS 739	Distributed Systems	24	4.57 out of 5
Spring	2012	CS 736	Advanced Operating Systems	35	4.45 out of 5
Spring	2011	CS 736	Advanced Operating Systems	30	4.68 out of 5
Fall	2010	CS 537	Introduction to Operating Systems	54	4.43 out of 5
Spring	2010	CS 537	Introduction to Operating Systems	40	4.41 out of 5
Fall	2009	CS 736	Advanced Operating Systems	29	4.56 out of 5
Spring	2009	CS 736	Advanced Operating Systems	14	4.77 out of 5

Past Ph.D. Students

1. Wei Zhang, 2009 – 2013
Publications: C17, C21, C22, C25, C26, C31, J5, J7, W6
Thesis: Improving concurrent software reliability via an effect-oriented approach
Employment: Researcher in IBM Research T.J. Watson

2. Adrian Nistor, 2012 – 2014 (co-advised with Prof. Darko Marinov)
Publications: C28, C35
Thesis: Understanding, detecting, and repairing performance bugs
Employment: Tenure-track assistant professor in Florida State University

3. Guoliang Jin, 2009 – 2014
Publications: C20, C21, C22, C24, C25, C27, C30, C32, C36, J7
Thesis: Diagnosing and Fixing Concurrency Bugs
Employment: Tenure-track assistant professor in North Carolina State University

4. Linhai song, 2010 – 2015
Publications: C22, C24, C28, C33, C36, C45, J7
Thesis: Understanding, Detecting and Diagnosing Real-World Performance Bugs
Employment: Tenure-track assistant professor at Penn State University

Past Master Students Advised

1. Joy James Prabhu Arulraj, 2011 -- 2013
Publications: C27, C32
Employment: Carnegie Mellon University for Ph.D.

2. Aaron Gravesdale (Master), 2010 – 2011

Employment: PDFTron

3. Joel Scherpelz (Master), 2009 – 2010
Publications: C21, C24, W5
Employment: Nvidia

4. Po-Chun Chang, 2012 – 2013
Publications: C27, C35

5. Dongdong Deng, 2012 – 2014
Publications: C25, C31, J7, W6
Employment: VMWare

6. Rui Gu, 2013 – 2014
Publications: C36
Employment: Columbia University for Ph.D.

Undergraduate Students Advised

1. Peisen Zhao, Univ. of Wisconsin, 2011 -- 2012
Winner of the 2011 Dewitt Undergraduate Scholarships
Publications: W6
Employment: Facebook

2. Borui Wang, Univ. of Wisconsin, 2011 – 2012
Publications: W6
Employment: Stanford for Master

3. Linjie Zhu, Univ. of Wisconsin, 2013
Publications: C36

4. Sophia Yang, Univ. of Chicago, 2015

5. Johanna Goergen, Washington & Lee University, 2015

6. Michelle Tocora, Kean University, 2015

7. Pranav Subramaniam, Univ. of Chicago, 2017
Publications: C51, C54

OUTREACH

15. Organizer of Diversity Workshop at SOSP 2017 2017

14. Panelist for the Collegiate Scholars Program at University of Chicago 2017
A program that helps high-school students, particularly those from underrepresented groups, from all over the city of Chicago to get prepared for colleges;

13. Advisor in the Student Inquiry and Research program of Illinois Mathematics & Science Academy
Advising a female high-school student for a 4-month research project 2017

12. Panelist at NSF REU Panel event "Women in Computing" 2016
DePaul University, Chicago, IL

11. Presenter at ACM SIGPLAN Programming Languages Mentoring Workshop @ PLDI 2016

10. CRA-W DREU advisor 2015
Hosting two female undergraduate students for summer research

9. Member of The Women in the Physical Sciences Committee 2015

8. Presenter at USENIX's Women In Advanced Computing Summit (WiAC) 2014

7. Panelist at CRA-W/SOSP Diversity Workshop 2013
I was a panelist in the "Demystifying career planning, elevator speeches, and picking good research topics" panel during CRA-W/SOSP Diversity Workshop 2013.

6. Program committee member of GHC (Grace Hopper Celebration of Women in Computing) Panels, Workshops, and Presentations 2012

5. Volunteers at EYH (Expanding Your Horizons – Young Women Exploring Math and Science Careers), an event for middle-school aged (6-8th grade) girls from south-central Wisconsin 2010, 2011
Offering "Computers in Sciences" career sessions to middle-school girls.

4. Member of ACM-W in University of Wisconsin, Madison 2009--2014
Regular dinners/breakfasts with female (prospective) students in our department.

3. Guest at the freshmen seminar of Women in Science and Engineering (WISE) residential learning community in University of Wisconsin 2009--2013
Discussing with freshmen girls who are interested in STEM fields about academics, career planning, etc.

2. Presenter at CRA-W/SOSP Diversity Workshop 2009
I gave a talk on "Hot Topics in Systems" during CRA-W/SOSP Diversity Workshop 2009.

1. Help supervise female undergraduate students in CRA-W DMP (Computing Research Association - Women Distributed Mentor Project) 2006
One of the students (Raluca A. Popa) won the CRA's Outstanding Undergraduate Award in 2009

FEDERAL GRANTS

CCF-1837120, FMitF: Collaborative Research: User-Centered Verification and Repair of Trigger-Action Programs
National Science Foundation
Investigator: Blasé Ur (PI), Shan Lu
Period: 2018 -- 2022
Amount: $666,666

CNS-1764039, CSR:Medium:Understanding and Automatically Adjusting Performance Sensitive Software Configurations
National Science Foundation
Investigator: Henry Hoffmann (PI), Shan Lu
Period: 2018 -- 2022
Amount: $1,149,113

CNS-1563956, CSR:Medium:DCRUGS:Combating Distributed Concurrency Bugs in Cloud Systems
National Science Foundation
Investigator: Haryadi Gunawi (PI), Shan Lu
Period: 2016 -- 2020
Amount: $799,977

IIS-1546543, BIGDATA: Collaborative Research: F: Holistic Optimization of Data-Driven Applications
National Science Foundation
Investigator: Shan Lu (PI), Alvin Cheung
Period: 2015 -- 2018
Amount: $1,200,000

CNS-1514256, CSR: Medium:Collaborative Research:Holistic, Cross-Site, Hybrid System Anomaly Debugging for Large Scale Hosting Infrastructures
National Science Foundation
Investigator: Xiaohui Gu (PI), Shan Lu
Period: 2015 -- 2019
Amount: $800,000

CCF-1439091, XPS: FULL: CCA: Production-Run Failure Recovery Based Approach to Reliable Parallel Software
National Science Foundation
Investigator: Shan Lu (PI), Karthikeyan Sankaralingam
Period: 2014 -- 2017
Amount: $750,000

CCF-1217582, A Framework for Self-Healing Multi-Threaded Software
National Science Foundation
Investigator: Shan Lu (PI), Benjamin R. Liblit
Period: 2012 -- 2015
Amount: $499,999

CCF- 1054616, Combating Performance Bugs in Software Systems
National Science Foundation
Investigator: Shan Lu (PI)
Period: 2011 -- 2016
Amount: $449,680

CCF- 1018180, Fighting Concurrency Bugs through Effect-Oriented Approaches
National Science Foundation
Investigator: Shan Lu (PI)
Period: 2010 -- 2013
Amount: $469,488