

Linhai Song

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Research Interests

- Performance Optimization & Tuning for Large Software
- Program Analysis, Security, and Software Testing

Employment

College of Information Sciences and Technology, PSU Assistant Professor	PENNSYLVANIA, USA 2017.08 – Present
FireEye Research Labs, FireEye, Inc. Staff Research Scientist	CALIFORNIA, USA 2015.11 – 2017.07

Education

University of Wisconsin-Madison Ph.D. in Computer Science (M.S. along the way) Advisor: Shan Lu Thesis: Understanding, Detecting, and Diagnosing Real-World Performance Bugs	WISCONSIN, USA 2010.08 – 2015.10
Institute of Computing Technology, Chinese Academy of Sciences M.S. in Computer Science Advisor: Xueqi Cheng	BEIJING, CHINA 2007.08 – 2010.06
Huazhong University of Science and Technology B.E. in Software Engineering	HUBEI, CHINA 2003.08 – 2007.06

Academic Awards

MICRO Best Paper Runner Up, 2014

- “COMP: Compiler Optimizations for Manycore Processors” published in MICRO’2014
- One of five papers selected from 273 MICRO’2014 submissions

ACM SIGPLAN Research Highlights Award, 2011

- “Automated Atomicity-Violation Fixing” published in PLDI’2011
- One of eight papers selected from all papers published in 13 ACM SIGPLAN conferences in 2011

Publications ¹

Refereed Conference and Workshop Publications

1. Tengfei Tu^S, Xiaoyu Liu, **Linhai Song**, Yiyang Zhang
Understanding Real-World Concurrency Bugs in Go, **ASPLOS’2019**.
2. **Linhai Song**, Xinyu Xing
Fine-Grained Library Customization, **SALAD’2018**.
3. **Linhai Song**, Shan Lu
Program Analysis for Inefficient Loops, **ICSE’2017**.
4. **Linhai Song**, Heqing Huang, Wu Zhou, Wenfei Wu, Yiyang Zhang
Learning from Big Malware, **APSys’2016**.
5. Rui Gu, Guoliang Jin, **Linhai Song**, Linjie Zhu, Shan Lu

¹Students directly under my supervision are denoted by “S”

- What Change History Tells Us About Thread Synchronization*, **FSE'2015**.
6. **Linhai Song**, Min Feng, Nishkam Ravi, Yi Yang, Srimat Chakradhar
COMP: Compiler Optimizations for Manycore Processors, **MICRO'2014**.
Won MICRO'2014 Best Paper Runner Up
 7. **Linhai Song**, Shan Lu
Statistical Debugging for Real-World Performance Problems, **OOPSLA'2014**.
 8. Adrian Nistor, **Linhai Song**, Darko Marinov, Shan Lu
Toddler: Detecting Performance Problems via Similar Memory-Access Patterns, **ICSE'2013**.
 9. Guoliang Jin*, **Linhai Song***, Xiaoming Shi, Joel Scherpelz, Shan Lu
Understanding and Detecting Real-World Performance Bugs, **PLDI'2012**.
(*: alphabetical order of surnames)
 10. Guoliang Jin, **Linhai Song**, Wei Zhang, Shan Lu, Ben Liblit
Automated Atomicity-Violation Fixing, **PLDI'2011**.
Won ACM SIGPLAN Research Highlights Award

Other Publications

1. Tengfei Tu^S, Xiaoyu Liu, **Linhai Song**, Yiying Zhang
Understanding Real-World Concurrency Bugs in Go, **OSDI'2018 Poster**.
2. **Linhai Song**, Shan Lu
Program Analysis for Inefficient Loops, UChicago CS **Technical Report TR-2016-06**.
3. 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
Fixing, Preventing, and Recovering from Concurrency Bugs, **Science China Information Sciences**, April 2015.
4. **Linhai Song**, Shan Lu
Statistical Debugging for Real-World Performance Problems, **GCASR'2015 Poster**.
5. **Linhai Song**, Shan Lu
Statistical Debugging for Real-World Performance Problems, UW-Madison CS **Technical Report 1803**.

Publications before Ph.D

1. Yan Guo, Huifeng Tang, **Linhai Song**, Yu Wang, Guodong Ding
ECON: An Approach to Extract Content from Web News Page, **APWeb'2010**.
2. **Linhai Song**, Xueqi Cheng, Yan Guo, Bo Wu, Yu Wang
Blog Post Extraction Using Title Finding, **CCIR'2009**.
3. Yu Wang, Bingxing Fang, Bo Wu, **Linhai Song**, Yan Guo
Schema Matching Incorporating with Attribute Distribution Features, **CCIR'2009**.
4. Feng Guan, Xiaoming Yu, Zeying Peng, Hongbo Xu, Yue Liu, **Linhai Song**, Xueqi Cheng
ICTNET at Web Track 2009 Ad-hoc Task, **TREC'2009**.
5. Xueke Xu, Yue Liu, Hongbo Xu, Xiaoming Yu, **Linhai Song**, Feng Guan, Zeying Peng, Xueqi Cheng
ICTNET at Blog Track TREC 2009, **TREC'2009**.
6. Bo Wu, Xueqi Cheng, Yu Wang, Yan Guo, **Linhai Song**
Simultaneous Product Attribute Name and Value Extraction from Web Pages, **WI'2009 workshop**.
7. **Linhai Song**, Xueqi Cheng, Yan Guo, Yue Liu, Guodong Ding
ContentEx: A framework for automatic content extraction programs, **ISI'2009 short**.

Patents

1. Min Feng, Srimat Chakradhar, **Linhai Song**
Compiler Optimization for Many Integrated Core Processors, U.S. Patent No. 20150277877, Oct 1st, 2015.

Professional Services

- PC co-chair of Student Research Competition (SRC) in ASPLOS'2019
- Reviewer of ASPLOS'2019
- Reviewer of CCS'2018
- PC member of APSys'2018
- PC member of Student Research Competition (SRC) in FSE'2018
- Reviewer of ISSTA'2018
- NSF Panelist 2018
- PC member of Student Research Competition (SRC) in ASPLOS'2018
- Reviewer of CCS'2017
- Reviewer of Transactions on Software Engineering
- Reviewer of Usenix ATC'2017
- Reviewer of Journal of Computer Science and Technology
- PC member of Artifact Evaluation session in PLDI'2015
- PC member of Artifact Evaluation session in ISSTA'2014

Talks

1. Performance Diagnosis for Inefficient Loops
Conference Presentation in ICSE'2017, May 2016
2. Improve Software Security and Performance through Data Analytics
The Pennsylvania State University, March 2016
3. Learning from Big Malware
Conference Presentation in APSys'2016, August 2016
4. Understanding, Detecting, and Diagnosing Real-World Performance Bugs
National University of Singapore, March 2016
5. Understanding, Detecting, and Diagnosing Real-World Performance Bugs
Microsoft Research Asia, December 2015
6. Understanding, Detecting, and Diagnosing Real-World Performance Bugs
Peking University, June 2015
7. Understanding, Detecting, and Diagnosing Real-World Performance Bugs
Pivotal Labs, May 2015
8. Statistical Debugging for Real-World Performance Problems
Conference Presentation in OOPSLA'2014, October 2014
9. Statistical Debugging for Real-World Performance Problems
WISDOM Workshop II, May 2014
10. Optimizing Memory Performance on Many Integrated Core Coprocessors
NEC Labs America, August 2013
11. Understanding and Detecting Real-World Performance Bugs
Conference Presentation in PLDI'2012, June 2012
12. Understanding and Detecting Real-World Performance Bugs
Programming Languages Seminar, University of Wisconsin-Madison, May 2012

Skills

- **Languages:** C/C++, C#, Java, Python, PHP, SQL, HTML, JavaScript, Bash
- **Instrumentation & Analysis:** LLVM, PIN, GCC, GDB
- **Tools & Libraries:** Pthread, OMP, STL, SVN, GIT, MySQL, SQLite
- **Platforms:** Linux, Windows, Intel MIC