

# Linhai Song

College of Information Sciences and Technology  
The Pennsylvania State University  
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Last update on April 20, 2018

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## Research Interests

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

## Employment

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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

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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

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### 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

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### Refereed Conference and Workshop Publications

1. **Linhai Song**, Shan Lu  
*Program Analysis for Inefficient Loops, ICSE’2017.*
2. **Linhai Song**, Heqing Huang, Wu Zhou, Wenfei Wu, Yiyang Zhang  
*Learning from Big Malware, APSys’2016.*
3. Rui Gu, Guoliang Jin, **Linhai Song**, Linjie Zhu, Shan Lu  
*What Change History Tells Us About Thread Synchronization, FSE’2015.*
4. **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**
5. **Linhai Song**, Shan Lu

*Statistical Debugging for Real-World Performance Problems*, **OOPSLA'2014**.

6. Adrian Nistor, **Linhai Song**, Darko Marinov, Shan Lu  
*Toddler: Detecting Performance Problems via Similar Memory-Access Patterns*, **ICSE'2013**.
7. Guoliang Jin\*, **Linhai Song\***, Xiaoming Shi, Joel Scherpelz, Shan Lu  
*Understanding and Detecting Real-World Performance Bugs*, **PLDI'2012**.  
(\*: alphabetical order of surnames)
8. 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. **Linhai Song**, Shan Lu  
*Program Analysis for Inefficient Loops*, UChicago CS Technical Report TR-2016-06.
2. 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.
3. **Linhai Song**, Shan Lu  
*Statistical Debugging for Real-World Performance Problems*, **GCASR'2015 Poster**.
4. **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

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- 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

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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

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- **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