

# Ryan (Peng) Huang

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Department of Computer Science  
3400 N. Charles Street  
Baltimore, MD 21218

**Email:** [huang@cs.jhu.edu](mailto:huang@cs.jhu.edu)  
**Web:** <https://www.cs.jhu.edu/~huang>  
**Office:** Malone Hall 231

## RESEARCH INTERESTS

Computer systems, cloud and mobile computing, reliability, programming languages

## EDUCATION

**University of California San Diego** 2010-2016  
Ph.D. in Computer Science  
Advisor: Prof. Yuanyuan Zhou  
Thesis: Toward Understanding and Dealing with Failures in Cloud-Scale Systems

**Peking University** 2006-2010  
B.S. in Computer Science, B.A. in Economics  
Graduate with honor  
Thesis: Design and Implementation of a Decentralized Social Network (*Outstanding Bachelor's Thesis*)

## PROFESSIONAL EXPERIENCE

**Johns Hopkins University**, Baltimore, MD Aug 2017-Present  
*Assistant Professor in Department of Computer Science*

**Microsoft Research**, Redmond, WA Aug 2016-July 2017  
*Postdoc Researcher*

**Facebook**, Menlo Park, CA June 2015-Apr 2016  
*Research Contractor*

**Facebook**, Menlo Park, CA June 2015-Sept 2015  
*Research Intern*

**Microsoft Research**, Redmond, WA June 2014-Sept 2014  
*Research Intern*

**Microsoft Research**, Redmond, WA June 2013-Sept 2013  
*Research Intern*

**Teradata**, San Diego, CA Nov 2011-Dec 2012  
*Part-time Research Intern*

**NetEase**, Beijing, China Mar 2010-June 2010  
*Software Engineer Intern*

## HONORS AND AWARDS

MICRO 2018 Best Paper Candidate 2018  
OSDI 2016 Best Paper Award 2016  
Outstanding Graduate in Beijing 2010  
Outstanding Bachelor's Thesis, Peking University 2010  
Founder Scholarship, Peking University 2009  
China National Scholarship, Ministry of Education of China 2008  
Wusi Scholarship, Peking University 2007

## PUBLICATIONS

### Refereed Conference Paper

- [1] Yigong Hu, Suyi Liu, and **Peng Huang**. A case for lease-based, utilitarian resource management on mobile devices. In *Proceedings of the 24th ACM International Conference on Architectural Support for Programming Languages and Operating Systems*, Providence, RI, April 2019. **ASPLOS '19**.
- [2] **Peng Huang**, Chuanxiong Guo, Jacob R. Lorch, Lidong Zhou, and Yingnong Dang. Capturing and enhancing in situ system observability for failure detection. In *Proceedings of the 13th USENIX Symposium on Operating Systems Design and Implementation*, Carlsbad, CA, October 2018. **OSDI '18**.
- [3] Rui Zhang, Calvin Deutschbein, **Peng Huang**, and Cynthia Sturton. End-to-end automated exploit generation for validating the security of processor designs. In *Proceedings of the 51st Annual IEEE/ACM International Symposium on Microarchitecture*, Fukuoka City, Japan, October 2018. **MICRO 51**. **Best Paper Candidate**.
- [4] Gennady Pekhimenko, Chuanxiong Guo, Myeongjae Jeon, **Peng Huang**, and Lidong Zhou. TerseCades: Efficient data compression in stream processing. In *Proceedings of the 2018 USENIX Annual Technical Conference*, Boston, MA, July 2018. **USENIX ATC '18**.
- [5] Tianyin Xu, Xinxin Jin, **Peng Huang**, Yuanyuan Zhou, Shan Lu, Long Jin, and Shankar Pasupathy. Early detection of configuration errors to reduce failure damage. In *Proceedings of the 12th USENIX Symposium on Operating Systems Design and Implementation*, Savannah, GA, November 2016. **OSDI '16**. **Best Paper Award**.
- [6] **Peng Huang**, Tianyin Xu, Xinxin Jin, and Yuanyuan Zhou. DefDroid: Towards a more defensive mobile OS against disruptive app behavior. In *Proceedings of the 14th Annual International Conference on Mobile Systems, Applications, and Services*, Singapore, Singapore, 2016. **MobiSys '16**.
- [7] Xinxin Jin, **Peng Huang**, Tianyin Xu, and Yuanyuan Zhou. NChecker: Saving mobile app developers from network disruptions. In *Proceedings of the 11th European Conference on Computer Systems*, London, United Kingdom, 2016. **EuroSys '16**.
- [8] **Peng Huang**, William J. Bolosky, Abhishek Singh, and Yuanyuan Zhou. ConfValley: A systematic configuration validation framework for cloud services. In *Proceedings of the 10th European Conference on Computer Systems*, Bordeaux, France, April 2015. **EuroSys '15**.
- [9] **Peng Huang**, Xinxin Jin, William J. Bolosky, and Yuanyuan Zhou. Why does a cloud-scale service fail despite fault-tolerance? In *The 11th USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, Broomfield, CO, October 2014. **Note: accepted with high-score reviews but withdrawn from publication per request by Microsoft**.
- [10] **Peng Huang**, Xiao Ma, Dongcai Shen, and Yuanyuan Zhou. Performance regression testing target prioritization via performance risk analysis. In *Proceedings of the 36th International Conference on Software Engineering*, Hyderabad, India, May 2014. **ICSE '14**.
- [11] Tianyin Xu, Jiaqi Zhang, **Peng Huang**, Jing Zheng, Tianwei Sheng, Ding Yuan, Yuanyuan Zhou, and Shankar Pasupathy. Do not blame users for misconfigurations. In *Proceedings of the 24th ACM Symposium on Operating Systems Principles*, Farmington, Pennsylvania, November 2013. **SOSP '13**.
- [12] Xiao Ma, **Peng Huang**, Xinxin Jin, Pei Wang, Soyeon Park, Dongcai Shen, Yuanyuan Zhou, Lawrence K. Saul, and Geoffrey M. Voelker. eDoctor: Automatically diagnosing abnormal battery drain issues on smartphones. In *Proceedings of the 10th USENIX Conference on Networked Systems Design and Implementation*, Lombard, IL, April 2013. **NSDI '13**.
- [13] Ding Yuan, Soyeon Park, **Peng Huang**, Yang Liu, Michael M. Lee, Xiaoming Tang, Yuanyuan Zhou, and Stefan Savage. Be conservative: Enhancing failure diagnosis with proactive logging. In *Proceedings of the 10th USENIX Conference on Operating Systems Design and Implementation*, Hollywood, CA, October 2012. **OSDI '12**.
- [14] Jing Jiang, Christo Wilson, Xiao Wang, **Peng Huang**, Wenpeng Sha, Yafei Dai, and Ben Y. Zhao. Understanding latent interactions in online social networks. In *Proceedings of the 10th ACM SIGCOMM Conference on Internet Measurement*, Melbourne, Australia, November 2010. **IMC '10**.

### Refereed Workshop Paper

- [15] **Peng Huang**, Chuanxiong Guo, Lidong Zhou, Jacob R. Lorch, Yingnong Dang, Murali Chintalapati, and Randolph Yao. Gray failure: The Achilles' heel of cloud-scale systems. In *Proceedings of the 16th Workshop on Hot Topics in Operating Systems*, Whistler, British Columbia, Canada, May 2017. **HotOS '17**.

## Journal Article

- [16] Jing Jiang, Christo Wilson, Xiao Wang, Wenpeng Sha, **Peng Huang**, Yafei Dai, and Ben Y. Zhao. Understanding latent interactions in online social networks. *ACM Trans. Web*, 7(4):18:1–18:39, November 2013.
- [17] Jing Jiang, Yongjun Li, Qinyuan Feng, **Peng Huang**, and Yafei Dai. A multiple user sharing behaviors based approach for fake file detection in P2P environments. *Science China Information Sciences*, 53(11):2169–2184, November 2010.

## Technical Report

- [18] **Peng Huang**, Craig Schechter, Vincent Chen, Steven Hill, Dongcai Shen, Yuanyuan Zhou, and Lawrence K. Saul. Experience in building a comparative performance analysis engine for a commercial system. Technical Report CS2015-1014, University of California, San Diego, September 2015.

## TEACHING EXPERIENCE

<b>CS 318: Principles of Operating Systems</b> , JHU <i>Instructor</i>	Fall 2018
<b>CS 817: Selected Topics in Systems Research</b> , JHU <i>Instructor</i>	Fall 2018
<b>CS 718: Advanced Operating Systems</b> , JHU <i>Instructor</i> , course evaluation rating: 4.86/5	Spring 2018
<b>CS 318: Principles of Operating Systems</b> , JHU <i>Instructor</i> , course evaluation rating: 4.5/5	Fall 2017
<b>CSE 120: Principles of Operating Systems</b> , UCSD <i>Teaching Assistant</i>	Fall 2014
<b>CSE 221: Advanced Operating Systems</b> , UCSD <i>Teaching Assistant</i>	Winter 2014
<b>CSE 120: Principles of Operating Systems</b> , UCSD <i>Teaching Assistant</i>	Spring 2013
<b>Introduction to Computation</b> , Peking University <i>Teaching Assistant</i>	Fall 2009

## PROFESSIONAL SERVICE

Program Committee Member for SOSP '19	2019
External Reviewer for NSDI '19	2018
NSF Panelist	2018
Program Committee Member for USENIX ATC '18	2018
Program Committee Member for USENIX ATC '17, SOSP SRC, SIGCOMM HotConNet	2017
Shadow Program Committee Member for EuroSys '17	2017
NSF Panelist	2016
Program Committee Member for MobiSys PhD '16 forum	2016
Journal Reviewer for IEEE TPDS 2016	2016
Assistant for ASPLOS '16 PC chair	2016

## DEPARTMENT SERVICE

Curriculum Committee	2018
Faculty Search Committee	2017

## GRANTS

Principal Investigator, <i>NSF CRII Award</i> , CNS-1755737, \$174,955	Aug 2018-Jul 2020
Principal Investigator, <i>Google Cloud Platform Research Credits</i> , \$14,000	Aug 2018-Feb 2019
Principal Investigator, <i>Microsoft Azure for Research Grant</i> , \$20,000	Aug 2017-Aug 2018

## TALKS

Capturing and Enhancing In Situ System Observability for Failure Detection

- OSDI 2018, *Oct 2018, Carlsbad, CA*
- Microsoft Azure, *Aug 2018, Redmond, WA*

Gray Failure: The Achilles' Heel of Cloud-Scale Systems

- HotOS XVI, *May 2017, Whistler, Canada*

CloudBrain: Toward Real-Time Intelligence for Highly-Available Cloud Systems

- Technical Briefing to Microsoft CVP and EVP, *March 2017, Redmond, WA*
- Technical Briefing to Azure CTO, *March 2017, Redmond, WA*

DefDroid: towards a more defensive mobile OS

- MobiSys 2016, *June 2016, Singapore*
- UCSD CNS Review, *Oct 2015, San Diego, CA*

Systematic configuration validation in cloud services

- Facebook, *June 2015, Menlo Park, CA*
- EuroSys 2015, *April 2015, Bordeaux, France*
- UCSD CNS Review, *Oct 2014, San Diego, CA*
- Microsoft Research, *Sept 2014, Redmond, WA*

Failures and misconfigurations in cloud – analysis, implications and practices

- Microsoft, *Sept 2013, Redmond, WA*

Performance regression testing target prioritization via performance risk analysis

- ICSE 2014, *June 2014, Hyderabad, India*

## OUTREACH

<i>Introduction to Cloud Computing</i> lecture at JHU Engineering Innovation summer program	June 2018
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## GRADUATE STUDENTS

Chang Lou, PhD, Johns Hopkins University	Fall 2017-Present
Yigong Hu, PhD, Johns Hopkins University	Fall 2017-Present
Brian Choi, PhD, Johns Hopkins University (co-advised with Randal Burns)	Fall 2018-Present
Ziyang Wang, Masters, Johns Hopkins University	Fall 2018-Present
Justin Shafer, Masters, Johns Hopkins University	Fall 2018-Present

## MASTER THESIS ADVISING

<i>Analysis of Memory Leaks in Linux Kernel</i> , Amitoj Chawla, Masters, JHU	Fall 2018
<i>Learning from Imbalanced Data</i> , Vincent Chen, Masters, UC San Diego	Fall 2013

## UNDERGRADUATE STUDENTS

Xu Meng, *Implementing efficient fault injection system*

Fall 2017-Spring 2018

Suyi Liu, *Analyzing app energy misbehavior*

Fall 2017-Spring 2018

Zach Silver, *Applying Soot on distributed systems*

Spring 2018-Summer 2018

## **OPEN-SOURCE SOFTWARE**

- Panorama: <https://github.com/ryanphuang/panorama>
- DefDroid: <https://defdroid.github.io>
- liballuxio: <https://github.com/ryanphuang/liballuxio>
- imembench: <https://github.com/ryanphuang/imembench>
- PerfScope: <https://github.com/ryanphuang/perfscope>