

PALLAVI JOSHI

OFFICE:

1600 Amphitheatre Pkwy
Mountain View, CA 94043

CONTACT:

Phone: (510) 229-7313
Email: pjoshi.cal@gmail.com

EMPLOYMENT

Software Engineer

Google, Mountain View, CA
September 2016 - Present

Software Engineer

Cloudera, Palo Alto, CA
January 2015 - August 2016

Researcher, Systems Analysis and Verification

NEC Laboratories America, Princeton, NJ
September 2012 - December 2014

EDUCATION

Ph.D., Computer Science, December 2012

University of California, Berkeley, CA, USA
Advisor: Professor Koushik Sen

M.S., Computer Science, December 2008

University of California, Berkeley, CA, USA
Advisor: Professor Koushik Sen

B.Tech., Computer Science and Engineering, July 2006

Indian Institute of Technology, Kharagpur, India

WORK EXPERIENCE

Cloudera

Palo Alto, CA

Software Engineer, January 2015 - August 2016.

- Working on various aspects of failure testing of Hadoop components: helping build the infrastructure, setting up realistic failure policies or scenarios, executing them against appropriate workloads, and triaging execution errors.

NEC Labs

Princeton, NJ

Researcher, September 2012 - December 2014.

- Worked on testing of robustness of cloud systems (e.g. Cassandra, HBase, and ZooKeeper). I helped design and implement a tool called Setsudo that simulates different kinds of failures (e.g. node crashes, network failures, etc.) and unexpected events (e.g. message reordering) to test if the given cloud system can recover correctly from those failures and events.
- Worked on debugging support for complex bugs in cloud systems. I designed and implemented a tool called ReproLite that provides a Domain Specific Language (DSL) in which testers can quickly and easily write their hunches regarding what caused a given bug. ReproLite then controls the execution of the given system to test the hunch expressed by the tester.
- Contributed towards a monitoring system that analyzes logs in a large-scale system to find anomalies and errors if present.

University of California

Berkeley, CA

Graduate Student Researcher for Professor Koushik Sen, Fall 2006 - Fall 2012.

- Designed and implemented dynamic analyses for finding various kinds of bugs in concurrent systems. The work focused on deadlocks and typestate errors, though the analyses can be extended to find other classes of bugs.
- Built an efficient failure-injection based tool, called PREFAIL, to find recovery bugs in distributed systems. PREFAIL lets testers easily implement their own strategies to prune down large state spaces of failures and their combinations that can be injected.

Intel Labs

Berkeley, CA

Intern for Dr. Mayur Naik, Summer 2009.

- Studied communication deadlocks in open source bug databases in an attempt to find an idiom whose violation would explain all the deadlocks. Experimented with different versions of a particular idiom, but in the end, realized that communication deadlocks cannot be summarized with a single or a few idiom violations. This realization led us to use model checking and a form of dynamic slicing to build an effective tool that can find both communication and resource deadlocks.

Microsoft Research

Bangalore, India

Intern for Dr. Ganesan Ramalingam, Summer 2007.

- Designed and implemented a static analysis to check the correctness of the reference counting algorithm used in NTFS.

Microsoft Research

Redmond, WA

Intern for Dr. John Dunagan and Dr. Helen Wang, Summer 2005.

- Worked on adding features to the domain-specific language of an application-level network protocol analyzer, and on improving the performance of the analyzer.

AWARDS

US Patent Filing Award, 2014

Sevin Rosen Funds Award for Innovation, EECS, UC Berkeley, 2011

Best BTech Project Award in Computer Science and Engineering, 2006

Rajiv Gandhi Science Talent Research Fellowship, 2003-04

PROGRAMMING LANGUAGES AND FRAMEWORKS

Have worked extensively with Java and Python in recent years. Knowledgeable about Ruby, Ruby on Rails, C, C++, Ocaml.

PUBLICATIONS

CloudSeer: Workflow Monitoring of Cloud Infrastructures via Interleaved Logs, *Xiao Yu, Pallavi Joshi, Jianwu Xu, Guoliang Jin, Hui Zhang, Guofei Jiang*, To appear in International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'16)

ReproLite : A Lightweight Tool to Quickly Reproduce Hard System Bugs, *Kaituo Li, Pallavi Joshi, Aarti Gupta, Malay Ganai*, In ACM Symposium on Cloud Computing (SoCC'14)

SAMC: Semantic-Aware Model Checking for Fast Discovery of Deep Bugs in Cloud Systems, *Tanakorn Leesatapornwongsa, Mingzhe Hao, Pallavi Joshi, Jeffrey F. Lukman, Haryadi*

S. Gunawi, In USENIX Symposium on Operating Systems Design and Implementation (OSDI'14)

Environment-Sensitive Performance Tuning for Distributed Service Orchestration, *Yu Lin, Franjo Ivancic, Pallavi Joshi, Gogul Balakrishnan, Malay Ganai, Aarti Gupta*, In the Ninth International Workshop on Automatic Performance Tuning (iWAPT'14)

SETSUDO: Perturbation-based Testing Framework for Scalable Distributed Systems, *Pallavi Joshi, Malay Ganai, Gogul Balakrishnan, Aarti Gupta, Nadia Papakonstantinou*, In Conference on Timely Results in Operating Systems (TRIOS'13). Poster at SOSP'13.

PREFAIL: A Programmable Tool for Multiple-Failure Injection, *Pallavi Joshi, Haryadi S. Gunawi, and Koushik Sen*, In 26th ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'11)
Also as Work-in-Progress report in 9th USENIX Conference on File and Storage Technologies (FAST'11)

FATE and DESTINI: A Framework for Cloud Recovery Testing, *Haryadi S. Gunawi, Thanh Do, Pallavi Joshi, Peter Alvaro, Joseph M. Hellerstein, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, Koushik Sen, and Dhruba Borthakur*, In 8th USENIX Symposium on Networked Systems Design and Implementation (NSDI'11)

Towards Automatically Checking Thousands of Failures with Micro-specifications, *Haryadi S. Gunawi, Thanh Do, Pallavi Joshi, Joseph M. Hellerstein, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, and Koushik Sen*, In 6th USENIX Workshop on Hop Topics in System Dependability (HotDep'10)

An Effective Dynamic Analysis for Detecting Generalized Deadlocks, *Pallavi Joshi, Mayur Naik, Koushik Sen, and David Gay*, In 18th ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE'10)

An Extensible Active Testing Framework for Concurrent Programs (Tools Paper), *Pallavi Joshi, Mayur Naik, Chang-Seo Park, and Koushik Sen*, In 21st International Conference on Computer Aided Verification (CAV'09)

A Randomized Dynamic Program Analysis Technique for Detecting Real Deadlocks, *Pallavi Joshi, Chang-Seo Park, Koushik Sen, and Mayur Naik*, In ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'09)

Predictive Tpestate Checking of Multithreaded Java Programs, *Pallavi Joshi and Koushik Sen*, In 23rd IEEE/ACM International Conference on Automated Software Engineering (ASE'08)

Predictive Testing: Amplifying the Effectiveness of Software Testing (Short Paper), *Pallavi Joshi, Koushik Sen, and Mark Shlimovich*, In Fifteenth ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE'07)

A Generic Application-Level Protocol Analyzer and its Language, *Nikita Borisov, David J. Brumley, Helen J. Wang, John Dunagan, Pallavi Joshi, and Chuanxiong Guo*, In 14th Annual Network and Distributed System Security Symposium (NDSS'07)

Design and Analysis of a Robust and Efficient Block Cipher using Cellular Automata, *Pallavi Joshi, D. Mukhopadhyay, and D. RoyChowdhury*, In International Conference on Advanced Information Networking and Applications'06

An Efficient Design of Cellular Automata based Cryptographically Robust One-Way Function, *D.Mukhopadhyay, Pallavi Joshi, and D.RoyChowdhury*, In International Conference on VLSI Design'07

PRESENTATIONS

“PREFAIL: A Programmable Tool for Multiple-Failure Injection”. OOPSLA 2011.

“PREFAIL: Programmable and Efficient Failure Testing Framework”. FAST 2011. Short (5 minutes) talk.

“An Effective Dynamic Analysis for Detecting Generalized Deadlocks”. FSE 2010.

“A Randomized Dynamic Program Analysis Technique for Detecting Real Deadlocks”. PLDI 2009.

“Predictive Typestate Checking of Multithreaded Java Programs”. ASE 2008.

TEACHING AND MENTORING EXPERIENCE

Mentored Xiao Yu from North Carolina State University for summer and fall internship (2014). He built a monitoring system using logs for Openstack-based clouds.

Mentored Kaituo Li from University of Massachusetts, Amherst for summer internship (2013). He helped with ReproLite, a tool that assists testers in quickly reproducing and debugging complex system errors.

Graduate Student Instructor for undergraduate-level Software Engineering (CS 169) course. I managed and mentored student project groups, designed homework and exams, held office hours, and took review lectures (2009).

PERSONAL

US Permanent Resident, Indian citizen