

Peizun Liu

Senior Software Engineer

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👤 <https://lpzun.github.io/>

Highlights

- A self-motivated researcher, engineer, problem solver, and deep thinker with an interdisciplinary mindset.
- Published a series of research results in top journals & conferences, like **ACM Transactions on Programming Languages and Systems**, **PLDI**, **CAV**, **ICJAR**, etc.
- Established expertise in **cloud computing**, **network systems**, **firewall**, **distributed systems**, programming languages, program analysis and formal verification.
- Extensive communication & leadership skills: worked as a **tech lead** at Google, and worked as a head TA for multiple semesters at Northeastern University.

Education

Northeastern University

Boston, MA

Sep 2012 – Aug 2019 | **Ph.D.** | [Computer Sciences](#)

- **Thesis:** Resource-Parameterized Program Analysis using Observation Sequences
- **Advisor:** Thomas Wahl

Tsinghua University

Beijing, China

Sep 2009 – Jul 2012 | **M.E.** | [Software Engineering](#)

- **Thesis:** Study and Application of Reverse Modeling and Checking PLC System
- **Advisor:** Guiming Luo

Chengdu University of Technology

Chengdu, China

Sep 2003 – Jun 2006 | **B.M.** | [Information Management & Information Systems](#)

Work Experience

Google

Sunnyvale, CA

Nov. 2021 – Present | Senior Software Engineer | [Andromeda Firewall](#)

- **Lead & own** multiple GCP premium firewall features. These features are significant and desirable to GCP users and are expected to be available soon.

Sep. 2019 – Oct. 2021 | Software Engineer III | [Andromeda Firewall](#)

- **Led & owned IPv6 firewall:** [IPv6 firewall](#) is a fundamental and indispensable building block for a secure IPv6 cloud environment. GCP IPv6 customers are using the IPv6 firewall everyday.
- **Led & owned multiple features** in [VPC firewall](#) and [hierarchical firewall policies](#) in GCP. Millions of GCP customers use these features everyday. These features are indispensable to protect various customers' services.

Tsinghua Tongfang

Beijing, China

Aug. 2006 – Oct. 2008 | Software Engineer | [Java Software Engineer](#)

- **Led & owned two sub-projects** of project [multi-functional Tsinghua University Uni-Card \(Tunicard\)](#), which can serve both as E-ID card and E-Wallet

- a system to allow users to manage their E-Wallet on touch screen POS terminal;
- a system to provide online payment service.

Research Experience

Research Interests

My research interests are **programming language**, **program analysis** and **formal verification**. The goal of my research is to improve the **quality** and **reliability** of various types of software, especially the critical system software. I am interested in **program synthesis** and **concurrency bug** analysis.

Selected Publications

- [1] **Peizun Liu**, Thomas Wahl and Thomas Reps. *Interprocedural Context-Unbounded Program Analysis Using Observation Sequences*. In ACM Transactions on Programming Languages and Systems (TOPLAS), Vol. 42, Issue. 4, pp.1-34, 2020.
- [2] **Peizun Liu**, Thomas Wahl and Akash Lal. *Verifying Asynchronous Event-Driven Programs Using Partial Abstract Transformers*. In 31st International Conference on Computer-Aided Verification (CAV), pp.386-404, 2019.
- [3] **Peizun Liu** and Thomas Wahl. *CUBA: Interprocedural Context-Unbounded Analysis of Concurrent Programs*. In 39th ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), pp.105-119, 2018.
- [4] **Peizun Liu** and Thomas Wahl. *IJIT: An API for Boolean Program Analysis with Just-in-Time Translation*. In 15th International Conference on Software Engineering and Formal Methods (SEFM), pp.316-331, 2017.
- [5] **Peizun Liu** and Thomas Wahl. *Concolic Unbounded-Thread Reachability via Loop Summaries*. In 18th International Conference on Formal Engineering Methods (ICFEM), pp.346-362, 2016.
- [6] Konstantinos Athanasiou, **Peizun Liu** and Thomas Wahl. *Unbounded-Thread Program Verification using Thread-State Equations*. In 8th International Joint Conference on Automated Reasoning (IJCAR), pp.516-531, 2016.
- [7] **Peizun Liu** and Thomas Wahl, *Infinite-State Backward Exploration of Boolean Broadcast Programs*. In 14th International Conference on Formal Methods in Computer-Aided Design (FMCAD), pp. 155-162, 2014.

Selected Talks

- [Infinite-State Backward Exploration of Boolean Broadcast Programs](#) at [FMCAD on Oct 24, 2014](#).
- [Concolic Unbounded-Thread Reachability via Loop Summaries](#) at [ICFEM](#) on Nov 18, 2016.
- [IJIT: An API for Boolean Program Analysis with Just-in-Time Translation](#) at [SEFM on Sep 06, 2017](#).

Service

- **Conference program committee member:** ICSEA 2018, ICSEA 2017.
- **Conference paper reviewer:** CAV 2018, VMCAI 2018, CAV 2017, FMCAD 2017, CAV 2015, CAV 2014, FMCAD 2014, DATE 2014, CAV 2013, FMCAD 2013, DATE 2013.

Skills & Interests

- **Programming languages:** C/C++ (proficient), Java, Python, Shell, OCaml, C#, SQL
- **Operating systems & tools:** Unix / Linux, Mac OS; Eclipse, NetBeans, Git, GDB; MySQL; etc.
- **Cloud networking:** rich experience on
 - cloud computing;
 - cloud networking, firewall, TCP/IP stack, IPv6, etc.;

- OSI model layer 3/layer 4 development.
- **Others:** proficient in multi-threaded programming, and rich experience on
 - distributed systems / static analysis / software formal verification;
 - software testing and performance / scalability analysis;
 - system architecture and algorithms;
 - SMT / SAT solving techniques, solvers and APIs (e.g., Z3, miniSAT).

Awards & Honors

2014	● SAT/SMT Summer School Grant	National Science Foundation
2013	● FMCAD Student Forum Grant	FMCAD Inc.