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## Highlights

- \* Motivated researcher, engineer, problem solver, and deep thinker with a interdisciplinary mindset
- \* Established expertise in programming languages, program analysis and formal verification
- \* Extensive communication skills: work as a head TA for three semesters to coordinate all aspects of courses

## Education

- \* Ph.D. Computer Science, Northeastern University 09/2012 – *present*  
Thesis: *Resource-Parameterized Program Analysis using Observation Sequences*  
Advisor: Thomas Wahl
- \* M.E. Software Engineering, Tsinghua University 09/2009 – 07/2012  
Thesis: *Study and Application of Reverse Modeling and Checking PLC System*  
Advisor: Guiming Luo
- \* B.M. Info. Mgmt. & Info. Syst., Chengdu University of Technology 09/2003 – 06/2006

## Technical Skills

- \* **Programming Languages:** C++ (*proficient*), Java, Python, Shell, OCaml, C, C#, SQL
- \* **Operating Systems & Tools:** Unix / Linux, Mac OS, Windows; Eclipse, NetBeans, Git, Emacs, GDB; MySQL; etc.
- \* **Others:** Multi-threaded programming; knowledge of distributed systems; knowledge of *static analysis*; knowledge of *software formal verification*; knowledge of software testing, verification and analysis; experience on system architecture and algorithms; SMT / SAT solving techniques, solvers and APIs (e.g., Z3, miniSAT); experience on performance and scalability analysis.

## Work Experience

- \* Research Intern MathWorks Natick, MA May. 2018 – Aug. 2018
- \* Software Engineer Tsinghua Tongfang Beijing, China Aug. 2006 – Oct. 2008

## Selected Projects

- \* ***Resource-Parameterized Program Analysis using Observation Sequences.*** We introduce a broad verification methodology for resource-parameterized programs that observes how changes to the resource parameter affect the behavior of the program.
  - *Recognitions:* Peer-reviewed publications in top conferences (PLDI, SEFM)
  - *Tools:* We delivered an automatic verifier written in C++. The tool is available online and ACM Digital Library. *Website:* [www.ccs.neu.edu/home/lpzun/cuba/](http://www.ccs.neu.edu/home/lpzun/cuba/)



- \* **Parameterized Verification.** We proposed a series of techniques for the notoriously hard problem of parameterized verification using concrete or symbolic techniques.
  - *Recognitions:* Peer-reviewed publications in conferences (IJCAR, ICFEM, FMCAD)
  - *Tools:* We delivered several automatic verifiers written in C++. The tools are all available online. *Website:* [www.ccs.neu.edu/home/lpzun](http://www.ccs.neu.edu/home/lpzun)
- \* **Simulink Model Analysis.** Analyze & verify Simulink models using various SMT solving techniques.
  - Translate Simulink models to constrained Horn clauses and verify them in SMT solvers;
  - Cluster proof objectives of a Simulink model to improve the verification performance.

## Research Experience

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 also interested in **program synthesis** and **concurrency bug** analysis.

### Selected Publications

- [1] **Peizun Liu** and Thomas Wahl, “CUBA: Interprocedural Context-Unbounded Analysis of Concurrent Programs”. In *PLDI*, pp.105-119, 2018.
- [2] **Peizun Liu** and Thomas Wahl, “IJIT: An API for Boolean Program Analysis with Just-in-Time Translation”. In *SEFM*, pp.316-331, 2017.
- [3] **Peizun Liu** and Thomas Wahl, “Concolic Unbounded-Thread Reachability via Loop Summaries”. In *ICFEM*, pp.346-362, 2016.
- [4] Konstantinos Athanasiou, **Peizun Liu** and Thomas Wahl, “Unbounded-Thread Program Verification using Thread-State Equations”. In *IJCAR*, pp.516-531, 2016.
- [5] **Peizun Liu** and Thomas Wahl, “Infinite-State Backward Exploration of Boolean Broadcast Programs”. In *FMCAD*, pp. 155-162, 2014.

## Professional Service

- \* *Conference program committee member:* **ICSEA 2018**, ICSEA 2017
- \* *Conference and workshop reviewing:* **CAV 2018**, **VMCAI 2018**, CAV 2017, FMCAD 2017, CAV 2015, CAV 2014, FMCAD 2014, DATE 2014, CAV 2013, FMCAD 2013, DATE 2013

## Graduate Courses

Advanced Algorithms, Intensive Computer Systems, Theory of Computation, Principles of Programming Languages, Engineering Reliable Software, Special Topics on Formal Methods, Software Verification, Machine Learning, Data Mining

## Honors and Awards

- \* SAT/SMT Summer School Grant (*value. \$1550*)      National Science Foundation      2014
- \* FMCAD Student Forum Grant (*value. \$600*)      FMCAD Inc.      2013