Xin Zhang

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RESEARCH INTERESTS

I am broadly interested in research topics related to programming languages, software engineering, and operating systems, including program analysis, program verification, program synthesis, mobile computing, cloud computing, and approximate computing. In order to build practical program reasoning tools that are sound, precise, and scalable, my current research focuses on various techniques to counter the effects of approximation in program reasoning. Such techniques include user-guided program analysis, abstraction refinement, and machine learning.

EDUCATION

Georgia Institute of Technology, USA 2011 - Present
Ph.D Student in Computer Science. GPA: 3.85/4.0
Advisor: Mayur Naik

Shanghai Jiaotong University, China 2007 - 2011
B.E. in Software Engineering. GPA: 3.7/4.0
Ranked 1 out of 120

HONORS AND AWARDS

Facebook Fellowship, 2015-2016.

ACM SIGSOFT Distinguished Paper Award for "A User-Guided Approach to Program Analysis" at the 10th joint meeting of the european software engineering conference and the ACM SIGSOFT symposium on the foundations of software engineering (FSE'15). (8 out of 73 accepted papers)

ACM SIGPLAN Distinguished Paper Award for "On Abstraction Refinement for Program Analyses in Datalog" at the 35th annual ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI'14). (3 out of 52 accepted papers)

Qualcomm Innovation Fellowship Finalist, 2014. (32 out of 137)

PUBLICATIONS

1. Sulekha Kulkarni, Ravi Mangal, **Xin Zhang**, Mayur Naik. Accelerating Program Analyses by Cross-Program Training. ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 2016.
2. Xujie Si, **Xin Zhang**, Vasco Manquinho, Mikolas Janota, Alexey Ignatiev, Mayur Naik. On Incremental Core-Guided MaxSAT Solving. International Conference on Principles and Practice of Constraint Programming (CP), 2016.
3. Ravi Mangal, **Xin Zhang**, Aditya Kamath, Aditya Nori, and Mayur Naik. Scaling Relational Inference Using Proofs and Refutations. Conference on Artificial Intelligence (AAAI), 2016.
4. **Xin Zhang**, Ravi Mangal, Mayur Naik, and Aditya Nori. Query-Guided Maximum Satisfiability. ACM Symposium on Principles of Programming Languages (POPL), 2016.

5. Ravi Mangal, **Xin Zhang**, Aditya Nori and Mayur Naik. Volt: A Lazy Grounding Framework for Solving Very Large MaxSAT Instances. International Conference on Theory and Applications of Satisfiability Testing (SAT), 2015.
6. Jongse Park, Hadi Esmaeilzadeh, **Xin Zhang**, Mayur Naik, and Bill Harris. FlexJava: Language Support for Safe and Modular Approximate Programming. ACM Symposium on Foundations of Software Engineering (FSE), 2015.
7. Ravi Mangal, **Xin Zhang**, Mayur Naik, and Aditya Nori. A User-Guided Approach to Program Analysis. ACM Symposium on Foundations of Software Engineering (FSE), 2015. **Distinguished Paper Award.**
8. **Xin Zhang**, Ravi Mangal, Radu Grigore, Mayur Naik, Hongseok Yang. On Abstraction Refinement for Program Analyses in Datalog. ACM Conference on Programming Language Design and Implementation (PLDI), 2014. **Distinguished Paper Award.**
9. **Xin Zhang**, Ravi Mangal, Mayur Naik, Hongseok Yang. Hybrid Top-down and Bottom-up Interprocedural Analysis. ACM Conference on Programming Language Design and Implementation (PLDI), 2014.
10. Jongse Park, Kangqi Ni, **Xin Zhang**, Hadi Esmaeilzadeh, Mayur Naik. Expectation-Oriented Framework for Automating Approximate Programming. Workshop on Approximate Computing Across the System Stack (WACAS) in conjunction with ASPLOS, 2014.
11. **Xin Zhang**, Mayur Naik, Hongseok Yang. Finding Optimum Abstractions in Parametric Dataflow Analysis. ACM Conference on Programming Language Design and Implementation (PLDI), 2013.
12. Cheng Zhang, Juyuan Yang, Yi Zhang, Jing Fan, **Xin Zhang**, Jianjun Zhao, Peizhao Ou. Automatic Parameter Recommendation for Practical API Usage. International Conference on Software Engineering (ICSE), 2012.

RESEARCH TALKS

A User-Guided Approach to Program Analysis

- IBM Programming Languages Day — December 2016
- New Jersey Programming Languages and Systems Seminar — September 2016

Petablox: Declarative Program Analysis for Big Code

- Google, Mountain View. Host: Dr. Domagoj Babic. — August 2016
- UC Berkeley. Host: Prof. Dawn Song. — August 2016
- Facebook Fellows Workshop — July 2016

Architectures and Systems for Mobile-Cloud Computing: A Workload-Driven Perspective

- Qualcomm Innovcation Fellowship Finalist Presentation — March 2014

POSITIONS HELD

Visiting Scholar, University of Pennsylvania — Fall 2016 - present

Research Intern, Microsoft Research Cambridge — Summer 2013
Worked with Josh Berdine on **SLAyer**, a formal verification tool for memory safety.

Research Assistant, Georgia Institute of Technology — Fall 2011 - present

TEACHING EXPERIENCE

CS6340: Software Analysis and Testing, Georgia Tech — Fall 2014
Teaching Assistant

CS4400: Introduction to Database Systems, Georgia Tech — Spring 2013
Teaching Assistant

STUDENT MENTORING

Sulekha Kulkarni, PhD student
Publication: Accelerating Program Analyses by Cross-Program Training. OOPSLA 2016.

Xujie Si, PhD student
Publication: On Incremental Core-Guided MaxSAT Solving. CP 2016.

Aditya Kamath, MS student
Publication: Scaling Relational Inference Using Proofs and Refutations. AAAI 2016.

SERVICE

PLDI 2017, External Review Committee

SPLASH 2016 Posters, Program Committee

CAV 2016, Artifact Evaluation Committee

OOPSLA 2016, Artifact Evaluation Committee

SKILLS

Programming languages: Java, C++, C, C#, JavaScript, PHP, OCaml, Datalog.

Tools: IDEs (Eclipse, Visual Studio, Netbeans, Adobe Dreamweaver, Zend Studio), Program Analysis Frameworks (Chord, ASM), Formal Proof Management Systems (Coq), Program Profilers (Yourkit), Compiler Infrastructures (LLVM), Editors (VI).

Natural languages: Mandarin (native speaker), English (fluent).