Shaowei Zhu

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EDUCATION

PRINCETON UNIVERSITY
PhD in Computer Science
2018-2023 (ECD) | Princeton, NJ
Field: Programming languages
Automated reasoning and proofs
Program analysis
Numerical abstract domains

GEORGIA TECH
BS in Computer Science
2015-2017 | Atlanta, GA
GPA: 4.0/4.0
Thread: AI & Modeling/Simulation
Faculty Honors (all semesters)

COURSEWORK

Programming Languages
Automated Reasoning
Advanced Computational Complexity
Theoretical Machine Learning
Advanced Computer Networks
Computer Vision

SKILLS

PROOF ASSISTANTS
Coq • F* • Dafny

PROGRAM ANALYSIS
Clang • LLVM
Z3 • APRON
KLEE • Java Path Finder

GENERAL PROGRAMMING
Java • Python • C/C++
OCaml • Matlab • LaTeX

MACHINE LEARNING
Scikit-learn • PyTorch

DISTRIBUTED COMPUTING
AWS products • Elasticsearch
MPI • MapReduce • Hadoop

WORK EXPERIENCE

AMAZON | Software Development Engineer
Feb 2018 - Aug 2018 | Seattle, WA
- AWS Pinpoint team.
- An auditing framework for the internal data storage system that ensures GDPR and HIPAA compliance of the product.
- End-to-end design, implementation, testing, and maintenance of a native AWS data pipeline that streams, stores, and serves queries against tens of billions of flexible-schema JSON objects every day.

AMAZON | Software Development Engineer Intern
May 2017 - Aug 2017 | Seattle, WA
- AWS Elastic Compute Cloud (EC2) Linux kernel team.
- Developed a static code analysis framework for Amazon Linux Kernel source repository that checks for coding style, locking behavior, type mismatches, etc. The framework reduces $> 95\%$ warnings/errors that need human inspection.

QBITLOGIC | Research Intern
Aug 2016 - Dec 2016 | Atlanta, GA
- Creating dynamic benchmarks for the company's automatic bug-fixing product that covers a wide range of common vulnerabilities listed in CVE.
- Preparing the training and testing datasets using fine-grained abstract syntax tree (AST) differencing, dependency analysis, and symbolic execution results.

RESEARCH

PROGRAMMING LANGUAGES GROUP | PhD Student
Advisor: Dr. Zachary Kincaid | Princeton
Automatically generating conditions under which a program is sure to terminate using algebraic methods such as polyhedral techniques and polynomial manipulations.

THE ARKTOS RESEARCH GROUP | Undergrad Researcher
Advisor: Dr. Alessandro Orso | Georgia Tech
Program analysis with an emphasis on interactive fault localization and applications of symbolic execution.
- Xiangyu Li, Shaowei Zhu, Marcelo d'Amorim, and Alessandro Orso. **Enlightened Debugging**. In proceedings of the 40th International Conference on Software Engineering (ICSE 2018).

COMPUTATIONAL BIOLOGY GROUP | Undergrad Researcher
Advisor: Dr. Srinivas Aluru and Dr. Vijay Vazirani | Georgia Tech
Parallel algorithms for genome assembly including approximating k-mer counts and scalable read alignment methods.
- Rahul Nihalani, Sriram Chockalingam, Shaowei Zhu, Vijay Vazirani, and Srinivas Aluru. **Probabilistic Estimation of Overlap Graphs for Large Sequence Datasets**. 2017 IEEE International Conference on Bioinformatics and Biomedicine.

PROJECTS

ANIMAL COATING PATTERNS GENERATION | Team Leader
Spring 2017 | Georgia Tech
Developing an animal coating patterns generator using an asynchronously updated Cellular Automata (CA) implementation of the activator-inhibitor model. Parameters could be tuned to generate spots and stripes on different scales. Also we introduced a process that generates realistic giraffe patterns.