Yuyang(Peter) RONG

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EDUCATION

UC Davis Sep 2019 - Jun 2024
Ph.D. candidate in Computer Science *Davis, CA*
- Research interests: **Fuzzing, Program Analysis, Software Security, Compiler Testing**
- Languages: **C/C++ (9/10), Rust (8/10), Python (8/10), Java**
- Tools: **LLVM (LLVM conributor w/ 23 commits and 2000+ LoC), libFuzzer, AFL++, Docker, Jira**

ShanghaiTech University Sep 2015 - Jun 2019
B.E. Computer Science and Technology *Shanghai, China*
- GPA 3.79/4 (Rank: 5/124) Excellent Undergraduate of Shanghai (2019) Scholarship of Shanghai (2016)

EXPERIENCE

Advanced Micro Devices, Inc. (AMD) Jul 2023 - Present
Research Intern *San Jose, CA*
- Focused on compiler scheduling algorithm of AI Engine (AIE).
- Developing a reinforcement learning based scheduling model for AIE
- Implementing GitHub Action script for weekly fuzzing of AIE, cooperate with DevOps to deploy the fuzzer.

Advanced Micro Devices, Inc. (AMD) Jun 2022 - Dec 2022
Research Intern *San Jose, CA*
- Focused on testing compiler backend (CodeGen) of AI Engine.
- Implemented IRFuzzer in 2000 LoC C++ to accommodate for the compiler infrastructure.
- Found over 40 missing features in AI Engine. Found **57 confirmed bugs in LLVM, 31 fixed**, bug tracker.
- Lightning talk accepted to 2022 LLVM Developer's Meeting, recording.

Bytedance Ltd. Jun 2020 - Sep 2020
Research Intern *Mountain View, CA*
- Focused on optimizing fuzzer Angora's gradient solver and alleviate its branch collision problem.
- Implemented a fuzzer Valkyrie with a runtime in ~2000 LoC in C++ and a gradient solver in ~3000 LoC in Rust.
- Found six bugs in open-source libraries, improved branch coverage by 41% compared to Angora.

Bytedance Ltd. Sep 2018 - Aug 2019
Research Intern *Beijing, China*
- Assigned to maintain Angora and use it to find integer bugs in Bytedance's codebase.
- Implemented a sanitizer as an LLVM pass w/ runtime library using ~1500 LoC in C++ and ~2000 LoC in Rust.
- Identified **8 crashing and 166 non-crashing bugs**. CVE-2020-18869 and CVE-2020-18871 assigned.

SELECTED PUBLICATIONS

Code Representation Pre-training with Complements from Program Executions 2024
The International Conference on Learning Representations (ICLR) *Under peer review*
IrFuzzer: Specialized Fuzzing for LLVM Backend Code Generation 2024
International Conference on the Foundations of Software Engineering (FSE) *Under peer review*
Understanding Programs by Exploiting Fuzzing Test Cases 2023
Association for Computational Linguistics (ACL)
Valkyrie: Improving Fuzzing Performance Through Principled Techniques 2022
Software Quality, Reliability, and Security (QRS) ***Best paper award***
IntEgrity: Finding Integer Errors by Targeted Fuzzing 2020
Security and Privacy in Communication Networks (SecureComm)
An Inexact First-order Method for Constrained Nonlinear Optimization 2022
Optimization Methods and Software

TEACHING

ECS153: Computer Security 2023 Spring Quater
ECS032A: Introduction to Programming 2020 Fall Quater