Yuyang(Peter) RONG

530 601 3646 ⋄ PeterRong96@gmail.com ⋄ [Website](#) ⋄ [GitHub](#)

EDUCATION

UC Davis   Sep 2019 - Jun 2024
Ph.D. candidate in Computer Science   *Davis, CA*
· Research interests: Software security, compiler validation, LLM in software engineering
· Skills: **C/C++ (9/10), Rust (8/10), Python (8/10), LLVM (IR, CodeGen), MLIR**, GitHub, Jira, Docker
· Community impacts: **LLVM contributor.** Bug fixes in backends, e.g. X86, AArch64, etc.
· Leadership & project management: **Manage a six-person team working on two projects simultaneously**

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 aeveloping a scheduling algorithm based on reinforcement learning for AI Engine (AIE).
· Preliminary results shows the new scheduling algorithm can reduce 5% cycles in the generated assembly code.
· 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 (AIE).
· Implemented [IRFuzzer](#) in 2000 LoC C++ to accommodate for the compiler infrastructure.
· Found over 40 missing features in AIE. Found **74 confirmed bugs in LLVM, 44 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)*
An Inexact First-order Method for Constrained Nonlinear Optimization	2022
Optimization Methods and Software	
IntEgrity: Finding Integer Errors by Targeted Fuzzing	2020
Security and Privacy in Communication Networks (SecureComm)	

TEACHING

ECS153: Computer Security	*(Best TA award)* Spring 2023
ECS032A: Introduction to Programming	Fall 2020