

# Yuyang(Peter) RONG

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## EDUCATION

### UC Davis

Sep 2019 - Dec 2022

*Ph.D. candidate Computer Science*

*Davis, CA*

- Languages: **Rust (9/10), C/C++ (8/10), Python (7/10)**
- Frameworks: **LLVM, Docker, Angora, AFL++**

### ShanghaiTech University

Sep 2015 - Jun 2019

*B.E. Computer Science and Technology*

*Shanghai, China*

- GPA 3.79/4 (Ranking: 5/124)
- Excellent Undergraduate of Shanghai (Jun 2019) ShanghaiTech President Scholarship (Oct 2016)
- Scholarship of Academic Excellence (Nov 2017) Shanghai Government Scholarship (Oct 2016)

## EXPERIENCE

### Advanced Micro Devices (AMD)

Jun 2022 - Sep 2022

*Research Intern*

*San Jose, CA*

- Focused on testing compiler backend of AI Engine.
- Implemented a state-of-the-art fuzzer to accomodate for the compiler infrastructure.
- Found 6 pattern matching bugs so far.

### Bytedance

Jun 2020 - Sep 2020

*Research Intern*

*Mountain View, CA*

- Focused on optimizing fuzzer Angora's gradient solver and alleviate branch collision problem.
- Implemented an LLVM pass in 2000 lines of C++ and a new gradient solver in 3000 lines of Rust.
- Improved branch coverage by 41% compared by Angora, 94% compare to AFL++.
- **Valkyrie: Improving Fuzzing Performance Through Principled Techniques** submitted to ISSRE 2022.

### Bytedance

Sep 2018 - Aug 2019

*Research Intern*

*Beijing, China*

- Assigned to find integer errors using Angora in Bytedance's codebase.
- Designed a sanitizer and implemented it as an LLVM pass with runtime library using around 1500 lines C++ and 2000 lines of Rust, maintainer of Angora ever since.
- Identified 8 crashing errors that could cause denial of service attack, [CVE-2020-18869](#) and [CVE-2020-18871](#) assigned; found 166 non-crashing errors that could cause program misbehave, reported to developers.
- **IntEgrity: finding integer errors by targeted fuzzing** published on SecureComm 2020.

### ShanghaiTech University

Nov 2017 - Jan 2018

*Lab Intern*

*Shanghai, China*

- Designed subproblem algorithm by combining line search and trust region.
- Implemented the algorithm using Python and did extensive experiments.
- Solved 113/126 problems, achieving a success rate of 89.7%.
- **An inexact first-order method for constrained nonlinear optimization** published on *Optimization Methods and Software*.

### ABB Group

Oct 2017 - Jun 2018

*Research Intern*

*Shanghai, China*

- The goal was to combine ABB's desktop robot [Yumi](#) and [Huskey UGV](#).
- Attached Yumi to an 4-wheel robot to make it autonomous and designed **navigation**, **mapping**, and **control** algorithms in around 5000 lines of C++.
- [Demonstrated](#) our prototype to the leader in ABB.

## PROJECTS

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### RITOS

Jan 2020 - Mar 2020

*ECS240 Operating system course project*

*UC Davis*

- Designed Rust IoT Operating System (RITOS) on raspberry pi 3.
- Implemented booting code and barebone binary in 1500 lines of Rust.
- Open-sourced [RITOS](#), also contributed to 100-star [Cortex-A to Rust binding project](#).

### Athernet

Jan 2018 - Jun 2018

*CS120 Computer networks course project*

*ShanghaiTech University*

- Designed computer networks from scratch, using sound as physical layer.
- Implemented Layer 1/2 in 3500 lines of JAVA and Layer 3/4 in 1500 lines of C++, [open-sourced](#).
- Demonstrated prototype by downloading a 10kB file from an FPT server with only athernet access, achieving 16.4 kbps bit rate (Upper bound 22 kbps).

### COOL Compiler

Jan 2018 - Jun 2018

*CS131 Compiler course project*

*ShanghaiTech University*

- Designed a new language COOL as part of the Compiler course project.
- Implemented end-to-end compiler including lexer, parser, semantic analysis, type analysis, and code generation.
- Implemented in using Flex, Bison, C++, open-sourced to [Github](#).

### Screen++

Jun 2017 - Jun 2017

*iLab Hackathon team leader*

*Shanghai, China*

- Proposed an application to connect all the screens in different platforms.
- Responsible for the software development & marketing model, constructed the prototype using Python & Apache.
- Won the **3rd prize** in iLab Hackathon.

### SafeBox

Jun 2017 - Jul 2017

*CS230 Operating system course project*

*ShanghaiTech University*

- Designed an abstraction layer to run untrusted software by intercepting unsafe system calls.
- Implemented the prototype in 1200 lines of Rust, [open-sourced](#).
- Successfully prevented untrusted submission from accessing Internet in online judge [Gradebot](#).