Haoyang Liu

ttturtle-russ ttturtle-russ.github.io ttturtleruss@hust.edu.cn

Education

Hong Kong University of Science and Technology Incoming
Ph.D. Department of Computer Science and Engineering

Huazhong University of Science and Technology Ongoing
B.Eng. School of Cyber Science and Engineering *GPA: 4.20/5, 87.0/100 Rank: 2/20*

Research Experience

LLM-assisted Linux Kernel Data Race Detection | *LLM Data-Race*

Research Assistant at HKUST advised by Prof.Dongdong She Jul. 2024 - Ongoing

- Proposed a systematic method that combines LLMs with traditional data race detection tools to conduct the Linux kernel concurrent vulnerability detection. LLMs' capability of data race conditions is unlimited, which can help cut down tons of false positives generated by static/dynamic analysis.
- Designed an effective prompt and tested several popular LLMs to test the boundary of LLMs' knowledge edge of concurrent vulnerabilities

LLM Benchmark | *LLM Benchmark CTF CVE*

Research Intern at UW-Madison advised by Prof.Chaowei Xiao Mar. 2024 - Sep. 2024

- Proposed a comprehensive evaluation of the capability of LLMs in solving CTF challenges and real-world security problems(CVE). The framework used a fully automated workflow within a unified environment.
- Evaluated different metrics of LLMs, including programming skills, command proficiency, and their thoughts on each step and each challenge. I built the unified environment and wrote the framework.
- LLM-Bench *Paper in preparation*

Verify Smart Contract | *Mythril Formal methods*

Research Intern at HUST advised by Prof.Bin Yuan, JINYINHU LAB Nov. 2023 – Mar. 2024

- Proposed a way to detect *Conditional Asset Frozen* with the formal method. We used Spin and Mythril to model the contract, then analyzed the model to find out if there is any path that can reach the *Frozen* condition.
- Customized a Mythril module to hook the EVM bytecode instruction and executed the contract statically.
- VeriSmartContract

Open Source

ArchLinux Testing Team

Member Apirl. 2024 – Ongoing

- I joined the ArchLinux Testing Team to help the community make sure that packages submitted to the testing repositories are functional. This includes, making sure that the package installs correctly, that it does not cause breakage with packages of which it depends on, among others.
- I've tested a few famous software such as openssl-3.3 and gedit.

ArchLinuxCN Repo Maintainer

Member Apirl. 2024 – Ongoing

- I joined the ArchLinuxCN community to help maintain the archlinuxcn repository. I'm also a packager in both the ArchLinuxCN community and AUR(Arch User Repo).

HUST OpenAtom Open Source Club

Kernel SIG Leader Nov. 2023 – Ongoing

- I actively participated in the club's open-source projects. I help develop the hustmirror-cli.
- I'm also the leader of Linux Kernel SIG. We contribute security patches and doc contributions for the kernel community.
- Now I'm responsible for the construction and maintenance of the HUST Mirror Site, I am also one of the maintainers of the hustmirror-cli AUR/DEB/RPM package.

Leadership and Hobbies

Overclock Student Associations

Co-Founder Oct. 2022 – Jan. 2024

- I built the team's business framework and participated in several projects as the person in charge.
- OverClock

Ministry of Culture and Sports of HUST CSE

Minister Sep. 2022 – Mar. 2024

- I led a team of 20 students to organize many cultural and sports activities to help students enrich their spare time.

Playing Basketball

- A fan of the NBA and Russell Westbrook.

Skills

Languages: C/C++, Golang, Python, x86 Assembly, LaTeX
Tools: Git/GitHub, Unix Shell, Docker

Language

Toefl iBT: 97 (R29 L23 S20 W25)