Haoyang Liu

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EDUCATION

Huazhong University of Science and Technology   Ongoing

B.S. School of Cyber Science and Engineering   *GPA: 4.20/5, 87.0/100 Rank: 2/20*

Coursework

- Assembly Language Programming (96/100)
- Software Security (90/100)
- Modern Cryptography (92/100)
- Operating System (85/100)
- Computer Telecommunications & Network (86/100)

AWARDS

Merit Student of HUST   Sep. 2022

National Cryptography Competition | *National 3rd*   Nov. 2023

CUMCM | *Provincial 2rd*   Sep. 2023

CISCN | *National 2rd*   Jul. 2024

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

QUIC Fingerprint Extraction based on Model Learning | *Model Learning L-Star Algorithm*

Leader of a team   Mar. 2024 - Ongoing

- Proposed a new method to use the server's fingerprints to identify the unknown implementation. It's based on the character of QUIC protocol named *state-transition*.
- Used $L*$ Algorithm to gain automata of different QUIC implementations, such as *MVFST(Meta)*, *QUICHE(Mozilla)*, and *MsQUIC(Microsoft)*. I built the mapper part of the system, which converts binary dataflow to abstract messages that the automaton can accept.

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.

LANGUAGE

Toefl iBT: 97 (R29 L23 S20 W25)