

Richard Liu

Graduate student at UIUC with a strong foundation in software development, cybersecurity, and low-level systems programming. Passionate about building efficient, scalable software solutions and leveraging technical expertise to solve complex engineering problems.

EXPERIENCE

Trail of Bits, New York, NY — *Software Engineer Intern*

DEC 2024 - JAN 2025

- Optimized pwndbg, a Python-based GDB debugging plugin, improving startup time by 15% and reducing loading time for key functionalities by 85%.
- Utilized Python profiling tools (e.g., cProfile, line_profiler) to identify and resolve performance bottlenecks in the codebase.
- Collaborated with senior engineers to refactor and enhance plugin architecture for better maintainability and scalability.

Battelle Memorial Institute, Columbus, OH — *Cyber Security (Software) Intern*

MAY 2024 - AUGUST 2024

- Designed and implemented fuzz testing tools in Python to identify vulnerabilities in embedded systems, leveraging hardware capabilities for efficient testing.
- Reverse-engineered firmware on mobile chipsets, documenting findings and proposing security improvements.
- Gained deep understanding of the Bluetooth protocol stack and its implementation in low-level systems.

Sandia National Labs, Albuquerque, NM — *R&D Software Intern*

MAY 2023 - DECEMBER 2023

- Developed debugging tools for low-level binary exploitation using Python, enabling efficient analysis of crash vectors and memory primitives.
- Reverse-engineered embedded systems using Ghidra, documenting system behavior and identifying potential vulnerabilities.
- Conducted dynamic analysis of firmware to uncover security flaws and improve system resilience.

EDUCATION

M.S. in Computer Science — *University of Illinois at Urbana-Champaign*

AUGUST 2024 - MAY 2026 (expected)

B.S. in Mathematics & Computer Science — *University of Illinois at Urbana-Champaign*

AUGUST 2021 - MAY 2024

3.9/4.0 GPA

Relevant Coursework: Algorithms, Computer Systems Organization, Computer Architecture

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DoD Secret Clearance

TECHNICAL SKILLS

Programming Languages:

Python, C/C++, Java, Assembly (x86/ARM), JavaScript

Tools & Frameworks:

Git, Docker, Linux, QEMU, Libfuzzer

Concepts:

Debugging, Reverse Engineering, Embedded

Systems, Fuzz Testing,

Algorithms, Data Structures

Protocols:

Bluetooth, TCP/IP

Projects

QEMU Snapshot Fuzzer:

Developed a fuzz testing

harness for QEMU integration

with libfuzzer for fuzz testing

arbitrary embedded systems.

Links

LinkedIn:

[linkedin.com/in/richard-liu-4](https://www.linkedin.com/in/richard-liu-4775571a7)

[775571a7](https://www.linkedin.com/in/richard-liu-4775571a7)

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