Hai Lin

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EDUCATION

Georgia Institute of Technology 08/2023 – 05/2025

M.S. in Cybersecurity, Information Security Specialization

University of Wisconsin-Madison 09/2019 – 05/2023

B.S. in Computer Engineering & Computer Sciences

- Cumulative GPA: 3.909/4.0 | Graduated with Distinction | Dean's List | Albert A. Radtke Scholarship

EXPERIENCE

Undergraduate Student Assistant | ECE252 | University of Wisconsin-Madison | Madison, WI 01/2023 – 05/2023

- Assisted the professor in delivering course content, addressing student questions, and clarifying topics.
- Addressed student inquiries in class and online, providing support and guidance.

Research Assistant | University of Wisconsin-Madison | Madison, WI 05/2022 – 09/2022

- Developed the Self-Propelled Instrumentation (SPI) software (C++), a project for conducting automatic binary analysis by injecting and inserting customized payload code for monitoring program performance and examining security properties using Dyninst API.
- Designed and implemented an agent program for generating software trace data to show a system's process architecture and resource access patterns, performing First Principles Vulnerability Assessment (FPVA) to uncover security risks and vulnerabilities.
- Improved SecSTAR, a front-end React application that visualized the dynamic FPVA relationship graph using the Cytoscape graph library.

PROJECTS

Penetration Testing | Hack The Box 05/2023 – Present

- Engaged in advanced penetration testing on the Hack The Box platform, honing skills in areas such as Web Attacks, Active Directory Exploits, Windows/Linux Privilege Escalation, and crafting effective shells and payloads.
- Compiled and analyzed detailed learning notes to ensure continuous growth and understanding of complex security challenges.
- Authored and published multiple in-depth penetration testing write-ups on a personal blog. These articles provide comprehensive logs and explain the rationale behind each step.

Independent Research: Cybersecurity & Malware Analysis | Self-Directed 09/2019 – Present

- Researched and tracked typical malware families with Virus Total, ABUSE.ch, and other threat intelligence platforms.
- Performed static and dynamic malware analysis using IDA Pro, x64dbg, and other reverse-engineering toolsets.
- Developed and tested YARA, Sigma, and HIPS detection rules, actively contributing to the security community.
- Evaluated the effectiveness of online threat analysis platforms by assessing their sandbox environments with Al-Khaser.

Android Audio App Development | Capstone 01/2023 – 06/2023

- Led backend development for a karaoke app, focusing on real-time audio processing techniques using the Oboe C++ library and Android NDK development toolset.
- Implemented voice augmentation, pitch correction, and other signal-processing techniques, resulting in a fully functional audio processing app.
- Developed a complete testing procedure using the Junit testing framework and integrated Github Actions workflows for

building the CI/CD pipeline.

Advanced Microprocessor Design | ECE 552 09/2022 – 12/2022

- Designed a high-performance single-cycle, five-stage pipeline MIPS microprocessor with Verilog.
- Implemented a two-way set-associative cache system, register bypassing and forwarding, branch prediction, and other optimization techniques for the microprocessor.
- Built customized unit tests, random tests, and complex testbench programs for verifying the CPU design.

WannaCry Ransomware Analysis Report | CS 642 09/2022 – 12/2022

- Deployed Threat Modeling techniques to investigate the WannaCry ransomware incident of 2017, examining its origins and development.
- Analyzed the technical details of the attack, including the program's binary code, the exploit, and the activation of the kill switch.
- Presented and discussed the solution for defending against future ransomware attacks, including patch management, endpoint protection, and local and cloud backup systems.

Operating Systems Component Implementation | CS 537 01/2022 – 05/2022

- Developed and implemented new xv6 sys calls, Linux shell program, and xv6 kernel thread synchronization for improved process management.
- Designed and implemented xv6 memory encryption with XOR page encryption, memory system management, and a Linux file system demo for data recovery.

Video Game Development on Embedded System | ECE 353 09/2021 – 12/2021

- Designed and implemented a video game using C programming language and FreeRTOS.
- Optimized game performance on MSP432P401R Microcontroller, ensuring seamless gameplay and user experience.

Convolutional Neural Networks for Image Recognition | CS 540 09/2021 – 12/2021

- Developed a state-of-the-art Convolutional Neural Networks model with MiniPlaces Dataset using PyTorch for image classification and recognition.
- Implemented test programs and scripts for verifying the model to ensure the high accuracy of the model and performance in image recognition tasks.

CERTIFICATES

Google Cybersecurity Certificate 05/2023

ACTIVITIES & AWARDS

Black Hat USA 2023 | Scholarship Program Recipient | Attendee 08/2023

Black Hat USA 2022 | Scholarship Program Recipient | Attendee 08/2022

Scalable Tools Workshop | Attendee 06/2022

HackMIT 2021 | Attendee 09/2021

Black Hat USA 2021 | Attendee 08/2021

SKILLS

Programming Languages	Java | C/C++ | Python
Frameworks & Libraries	Qt Framework | PyTorch | React
Operating Systems	Windows OS internals | Linux OS internals | Android | FreeRTOS
Reverse Engineering	x64dbg | IDA Pro | Ghidra
Hardware Design & Circuit Analysis	Verilog | SystemVerilog | Digital System Design & Synthesis