

Hung Mao (Rafael) Chen

(+1)571-595-9608 | hchen28@gmu.edu | <https://github.com/shinmao> | <http://blog.1pwnch.com>

EDUCATION

George Mason University

PhD in Information Security, Advisor: Professor Kun Sun

Fairfax, VA

Aug 2021 - present

George Mason University

Master of Science in Computer Science

Fairfax, VA

December 2020

National Central University

Bachelor of Science in Computer Science

Taoyuan, Taiwan

June 2017

RESEARCH PROJECTS

Automatic Program Repair via Patch Analysis

Sep 2021 – Present

Advisor: Professor Kun Sun

- Automated vulnerability repair through static analysis and binary rewriting with Egalito recompilation framework. Currently working on defective function localization with binary diffing.

EXPERIENCE

Research Assistant

Feb 2021 – Present

Sun Security Lab, George Mason University

Fairfax, VA

- Designed and implemented novel binary diffing/instrumentation tools for automated program repair.

Research Assistant

Aug 2020 – Oct 2021

Community Informatics Lab (CIL), George Mason University

Fairfax, VA

- Designed a learning taxonomy system and corresponding algorithm to recommend prerequisites for education.
- Designed mapping algorithm from NIST to Wikipedia with accuracy of 92% to extract graph-based features.
- Applied Infomap algorithm with tuned weights to get accuracy of recommendations higher than 80%.

Security Consultant

July 2017 – November 2017

Acer eDC

Taipei, Taiwan

- Performed black box penetration testing on operating systems and network structure of companies.
- Responsible for development of network automation tools and secure coding practices for web development.
- Responsible for providing project manager with evaluation report and hardening guidelines.

Full-Stack Web Developer

Aug 2015 – June 2017

Computer and Network Center, National Central University

Taoyuan, Taiwan

- Built up and maintained a web platform for communication between college and students.
- Developed Lost and Found service to help students verify their lost things in campus.

PROJECTS

Shelf-Display Analysis

November 2019 – December 2019

- An analysis on relationship between multiple products to create a Visual Merchandise Design.
- Implemented association rule analysis on transaction records with Apriori algorithm.

Password Manager

Github: [shinmao/pwd-manager](https://github.com/shinmao/pwd-manager)

- A web service for password management based on framework of Django.
- Responsible for users' confidential data management in database based on sqlite engine in server side.
- Returned password or secret to users via two-factor authentication based on all-auth.

Service Desk System

<https://ncu.edu.tw/SD/>

- A web service provided students in college with service of forum and online chatroom, etc.
- Responsible for development based on Laravel framework and deployment on CentOS server.
- Increased the number of users from college by 30%.

RELATED EXPERIENCE & ACHIEVEMENTS

- Member of K3RN3L4RMY(<https://ctftime.org/team/143202>)
- Speaker of Mason Competitive Cyber club for Binary Exploitation and Web Security
- Second prize (2/20) in DwagCTF 2019, responsible for PWN, Web Security
- PatriotCTF 2018 (<https://patriotctf.gmu.io/>) challenges maker for PWN, Web Security
- Third prize in BesidesNovaCTF 2018, responsible for Web Security
- Ranked 4th in MetropolisCTF 2018, responsible for Web Security
- Report SQL injection vulnerabilities to Bug Bounty platform(<https://zeroday.hitcon.org/>)
- More CTF experience to be found in github repo of CTF-writeups(<https://github.com/shinmao/CTF-writeups>)

TECHNICAL SKILLS

Languages: C/C++, Java, Python, SQL, JavaScript (Node.js), PHP

Frameworks, Libraries, and Tools: Laravel, Django, Hadoop, Spark, Git, Docker, AWS EC2/EMR, Tensorflow

Tools: Burpsuite, Kali Linux, Wireshark, IDA pro, Angr, Egalito

Development: Web Development, Software Development, Mobile Application Development(Android)

Others: Machine Learning, Web Security, Binary Exploitation