Paul Yi Won Chung

me@pywc.dev
https://pywc.dev/
1210 W Dayton St, Madison, WI 53706

Research Interests

Cybersecurity, Privacy, Anti-censorship, Operating Systems, Networking, Cloud Computing, Cryptography

Education

University of Wisconsin-Madison — Fall 2020 ~ Present
B.S. Honors Candidate, Computer Sciences & Data Science — GPA: 4.0/4.0
Thesis: Network Censorship Measurement and Evasion Framework
Advisor: Rahul Chatterjee

Neung-In High School — Spring 2017 ~ Fall 2019
STEM High School Degree — Daegu, Republic of Korea

Positions

University of Wisconsin-Madison - MadS&P — Madison, WI
Undergraduate Research Assistant — Jun 2021 ~ Present

UW-Madison Cybersecurity Operations Center — Madison, WI
Cybersecurity Intern Analyst — Oct 2020 ~ Present

Cybersecurity UW Club — Madison, WI
Head Officer & CTF Team Member — Sep 2020 ~ Present

Carnegie Mellon University – CyLab — Pittsburgh, PA
Undergraduate Research Assistant — Summer 2022

Igloo Security — Seoul, Republic of Korea
Cybersecurity Intern Analyst — Summer 2019

Research

Network Censorship Measurement and Evasion Framework — Sep 2022 – Present
UW-Madison Security & Privacy Research Group (MadS&P) — Advisor: Rahul Chatterjee
- Implemented a data leakage threat model for the iOS app group containers
- Analyzed the group containers for 200 iOS apps to detect potential leakage for restricted data

Engineering Privacy in iOS App Groups — Summer 2022
Carnegie Mellon University Information Networking Institute (INI) — Advisor: Hanan Hibshi
- Implemented a data leakage threat model for the iOS app group containers
- Analyzed the group containers for 200 iOS apps to detect potential leakage for restricted data

picoCTF: Cybersecurity Education through Gamification Theory — Summer 2022
Carnegie Mellon University Security & Privacy Laboratory (CyLab) — Advisor: Hanan Hibshi
- Developed five NLP-based and five CNN-based Adversarial Machine Learning challenges
- Constructed a user study for the challenges to be released at picoCTF 2023
- Introduced “ramped” difficulty system, optimized for beginning learners

CookieEnforcer: Automated Cookie Notice Analysis and Enforcement — Feb 2022 ~ Present
Wisconsin Privacy & Security Research Group (WI-PI) — Advisor: Kassem Fawaz
- Explored the results of the front-end interface user study for the CookieEnforcer backend
- Developed a Chrome Extension that connects the CookieEnforcer backend with the React.js frontend
- Published the extension to Chrome Extension Store

Securely Measuring Password-based Logins — Jun 2021 ~ Present
UW-Madison Security & Privacy Research Group (MadS&P) — Advisor: Rahul Chatterjee
- Analyzed 30 million network packets to find a pattern of credential stuffing attacks
- Used Pandas and Matplotlib of Python to visualize and find edge cases from the data
- Found multiple patterns that exhibited anomalies

Zero-day Vulnerability Analysis and Exploitation — Mar 2019 ~ May 2020
Daegu University Information Security Research Group — Advisor: Chang Hoon Kim
- Analyzed the risk factor of CVE-2019-0708 (Bluekeep) RDP vulnerability on traditional embedded systems
- Designed a Python Proof of Concept script that sends payloads to execute arbitrary code on the vulnerable system
- Poster presented the research as the primary author at *Conference on Information Security and Cryptology-Winter, 2019*

Publications

[1] **Yi Won Chung**, Tae Gyeom Heo. Exploitation of RDP Bluekeep on Embedded Systems and Possible Mitigations. *Proceedings of the Conference on Information Security and Cryptography-Winter, 2019.*

Projects

Node.js Full-stack Web Application HackMIT, 2021

- Designed a RESTful Backend API model and implemented it via Express and PostgreSQL
- Implemented a simple front-end web interface with EJS and integrated it to the backend
- Deployed resulting web app "FoodSurfers", similar with the AirBnB platform to Microsoft Azure

Voice-based Interactive Chatbot Neung-In Scholarly Awards, 2018

- Designed a school chatbot server and to parse lunch and academic calendar information from the school website
- Deployed the app to Google Cloud Platform and used the Google Dialogflow API to service it via Google Assistant
- Attained school member usage rate of 85% by 2 months of release

Honors and Awards

- Carnegie Mellon University Summer 2022 Undergraduate Research Scholarship
- Top 2%, National Cyber League Spring 2022 Team Game
- 5th Place, Korea Ministry of Education Cybersecurity CTF Competition, 2019 (Team *"College Chancellor Aspirant Shin Jinwoo"*)
- Research of the Year, Neung-In Scholarly Awards, 2018

Skills

- Programming Languages: Python, C, C++, Java, JavaScript, PHP, Rust
- Technologies:
    - General: Git, LaTeX, Numpy
    - Data Analysis: Pandas, Matplotlib, R
    - Machine Learning: Scikit, TensorFlow, Keras, NLTK
    - Systems: Socket, Docker, CMGR
    - Web: HTML, Flask, Django, Jekyll, Hugo, React.js
    - Security: Pwntools, Elasticsearch, Cisco AMP
    - Database: MySQL, PostgreSQL, MongoDB
    - Cloud: Google Cloud, Microsoft Azure, Amazon AWS
- Language: English and Korean (Native), Japanese and Spanish (Basic)