

Sungwoo Kim

(765) 772-5280 | kim3583@purdue.edu

EDUCATIONS

Purdue University

Ph. D. in Computer Science

- Co-advised: Dave (Jing) Tian and Dongyan Xu

West Lafayette, Indiana

Aug. 2021 – Now

Kwangwoon University

B.S. in Electronics and Communications Engineering

- Advisor: Suwon Park

Seoul, Republic of Korea

Mar. 2014 – Feb 2020

WORK EXPERIENCES

Inedit Corp.

Software Developer

- Maintained a mobile application “brandazine” using Django REST Framework, Vue.js, and Cordova

Seoul, Republic of Korea

Apr. 2021 – Jul. 2021

Purdue University

Research Intern, Department of Computer Science

- Internship advisor: Dave (Jing) Tian
- Researched on securing the Controller Area Network (CAN) communications by using binary analysis

West Lafayette, Indiana

Aug. 2020 – Feb. 2021

F1Security

Researcher

- Developed a low overhead Honeynet system for embedded devices
- Developed an anti-virus system for web server using Go and RabbitMQ

Seoul, Republic of Korea

May 2018 – Jan. 2020

Republic of Korea Cyber Operations Command

Sergeant

- Developed and maintained military software

Seoul, Republic of Korea

Jun. 2016 – Mar. 2018

Korea Information Technology Research Institute

Trainee at the “Best of the Best (BoB)” Program

- Trained and practiced security techniques: binary analysis, SQL injection, buffer overflow, etc.
- Reported vulnerabilities discovered from a commercial car rental system

Seoul, Republic of Korea

Jun. 2014 – Dec. 2014

PROJECTS

Binary Patcher | *Embedded System, In-vehicle Network Security, Binary Rewriting*

Sep. 2020 – Feb. 2021

- Designing and developing a binary firmware patcher for Tricore and RH850 architectures used in Automotive Electronic Control Units (ECUs)

Virtualization for IoT Devices (VIoT) | *Embedded System, Network Security*

Jan. 2019 – Dec. 2019

- Designed and implemented VIoT, network virtualization for IoT devices to reduce and manage scarce computing resources in embedded systems
- Developed a web portal to manage individual virtual devices and traffic in the IoT Honeynet system
- Filed and published a patent titled “Honeynet System For Internet Of Things Using Packet Virtualization”

Domain Name Service (DNS) Sinkhole Firewall | *Firewall, Network Security*

Jan. 2017 – Dec. 2017

- Designed and implemented a firewall functionality based on the DNS servers
- Designed a technique to trace the endpoint IPs of domain name query packets, which are usually hidden due to the Network Address Translator (NAT)
- Filed and published a patent titled “Origin Tracking Method And System Using DNS Server For Infected System”

Penetration Test in Car Rental Systems | *Cyber-physical System, Offensive Security*

Jul. 2014 – Nov. 2014

- Analyzed and reported a critical vulnerability (e.g., attackers could unlock doors of a car on the road)

TEACHING EXPERIENCES

Instructor

SpotMicro, Embedded Software Programming

- Lectured the programming for a four-legged robot

Hongik University High School

Mar. 2021 – Jul. 2021

PATENTS

Honeynet System for Internet Of Things using Packet Virtualization

Jul. 2019

Korean Patent

- Proposed a new technique for handling huge packets in hardware constrained systems
- Patent No.: 102062718

Origin Tracking Method and System using DNS Server for Infected Systems

Oct. 2018

Korean Patent

- Proposed a new technique for tracking the senders of DNS queries under network address translators (NAT)
- Patent No.: 101961451

ADDITIONAL INFORMATION

Programming: Proficient in C, C++, C#, Golang, NodeJS, Java, Python, SQL, HTML/CSS.

Software Tools: Experienced with binary analysis and debugging tools: IDA Pro, Ghidra, and OllyDBG

Languages: Native Korean; Proficient in English

Hobby: Ardent player of classical musics; the principal violist in the university orchestra
(Youtube link: https://youtu.be/uz4PBsXN_6s)