Sungwoo Kim

Ph. D. Student in Computer Science researching system security
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RESEARCH INTERESTS

Kernel Security, Fuzz testing, System Security, Program Analysis, Cyber-Physical System.

RESEARCH

Bluetooth Fuzzing for Kernels
- A system automatically finds vulnerabilities in Bluetooth implementations.
- Found 31 previously unknown bugs in the Linux and Zephyr kernels.

Secure Controller Area Network (CAN)
- Adding reliability on CAN by adding backward-compatible authentication scheme.

EDUCATION

Purdue University, *Ph. D. in Computer Science* — West Lafayette, IN, USA
Advisors: Dave (Jing) Tian and Dongyan Xu — 2021 – Now

Kwangwoon University, *B.S. in Electronics and Communications Engineering* — Korea
Advisor: Suwon Park — 2014 – 2020

WORK EXPERIENCE

Purdue University, Dept. of Computer Science — West Lafayette, IN, USA
Graduate Research Assistant — 2021 – Now
- Kernel testing

Inedit Corp. — Seoul, Republic of Korea
Software Engineer — Apr. – Jul. 2021
- Startup; Web/app development.

Purdue University, Dept. of Computer Science — West Lafayette, IN, USA
Research Intern — Aug. 2020 – Jul. 2021
- In-vehicle network security research

F1Security — Seoul, Republic of Korea
Software Engineer — May 2018 – Jan. 2020
- Worked for an honeypot system for embedded devices (Patented)

Republic of Korea Cyber Operations Command — Republic of Korea
Sergeant; Software Security Engineer — Jun. 2016 – Mar. 2018

CONFERENCE PUBLICATIONS

[C2] Fuzz The Power: Dual-role State Guided Black-box Fuzzing for USB Power Delivery
Kyungtae Kim, **Sungwoo Kim**, Kevin Buttler, Antonio Bianchi, Rick Kennell, Dave (Jing) Tian
*32nd USENIX Security Symposium (Security'23), Anaheim, CA, August 2023 (**USENIX '23**)*
Anaheim, CA, August 2023 *Acceptance Rate: 29.2%*

[C1] ShadowAuth: Backward-Compatible Automatic CAN Authentication for Legacy ECUs
Sungwoo Kim, Gisu Yeo, Taegyu Kim, Junghwan "John" Rhee, Yuseok Jeon, Antonio Bianchi, Dongyan Xu, and Dave (Jing) Tian
*Proceedings of the 2022 ACM Asia Conference on Computer and Communications Security (**ASIACCS '22**)*
Nagasaki, Japan, May 2022, *acceptance rate=18.4%*

CVES

Linux Kernel (9)
- CVE-2024-50255, CVE-2024-38620, CVE-2024-36968, CVE-2024-36013, CVE-2024-36012, CVE-2024-36011, CVE-2023-40283, CVE-2023-28866, CVE-2022-45934

Commercial Drone (1)
- CVE-2021-34125

COMMUNITY SERVICE

Artifact Evaluation Committee (AEC)
- USENIX Security Symposium (USENIX) 2024

Open Source Contributions
- Reported & patched 18 bugs in the Linux and Zephyr kernel Bluetooth subsystem
- Developed & maintainining https://cspapers.org, attaining 159 GitHub stars

PATENTS

[PT2] Honeynet System for Internet Of Things using Packet Virtualization
[PT1] Origin Tracking Method and System using DNS Server for Infected Systems