Sukwha Kyung

Summary

Ph.D. student with research experience in next-generation network technologies including network slicing, software-defined networking (SDN), and network function virtualization (NFV). Expert in security orchestration and vulnerability analysis with machine learning in 5G/6G RAN and CN architecture with work experience at Renewable Renewable Energy Laboratory (NREL).

Education

Arizona State University Tempe, AZ
Ph.D. in Computer Science (Cyber Security) *Jan 2018 – May 2026*
- Research Area: Security management, orchestration, and vulnerability analysis of next-generation network technologies
- Advisor: Dr. Gail-Joon Ahn

Arizona State University Tempe, AZ
Masters in Computer Science *Aug 2015 – Dec 2017*
- Thesis: *HEF: A Hardware-Assisted Security Evaluation Framework*
- Advisor: Dr. Gail-Joon Ahn

Arizona State University Tempe, AZ
B.S. in Computer Science *Aug 2011 – May 2015*

Research Publications

1. **Sukwha Kyung**, Jaejong Baek, and Gail-Joon Ahn. *Unveiling SDN Controller Identity through Timing Side Channel*. Proceedings of IEEE 15th International Conference on Network of the Future (NoF), 2024.
2. Jaejong Baek, PKD Soundrapandian, **Sukwha Kyung**, et al. *Targeted Privacy Attacks by Finerprinting Mobile Apps in LTE Radio Layer*. Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2023.
3. Penghui Zhang, Zhibo Sun, **Sukwha Kyung**, et al. *I'm Spartacus, No, I'm Spartacus: Proactively Protecting Users from Phishing by Intentionally Triggering Cloaking Behavior*. Proceedings of the 29th ACM Conference on Computer and Communications Security (CCS), 2022.
4. Hongxin Hu, Wonkyu Han, **Sukwha Kyung**, et al. *Towards a Reliable Firewall for Software-Defined Networks*. Computers & Security, Vol 87, p. 101597, 2019.
5. Jaejong Baek, **Sukwha Kyung**, Haehyun Cho, et al. *Wi Not Calling: Practical Privacy and Availability Attacks in Wi-Fi Calling*. Proceedings of the ACM Annual Computer Security Applications Conference (ACSAC), 2018.
6. Vaibhav Dixit, **Sukwha Kyung**, Ziming Zhao, et al. *Challenges and Preparedness of SDN-based Firewalls*. Proceedings of the ACM International Workshop on SDN-NFV Sec, 2018
7. Ankur Chowdhary, Vaibhav Hemant Dixit, Naveen Tiwari, **Sukwha Kyung**, et al. *Science DMZ: SDN-Based Secured Cloud Testbed*. Proceeding of IEEE NFV-SDN, 2017.
8. **Sukwha Kyung**, Wonkyu Han, Naveen Tiwari, et al. *HoneyProxy: Design and Implementation of Next-Generation of Honeynet via SDN*. Proceedings of IEEE Conference on Communications and Network Security (CNS), 2017.

Patent

Jaejong Baek, **Sukwha Kyung**, Gail-Joon Ahn. *Systems and methods for blockchain-based automatic key generation*. U.S. Patent 11588631, 2023.

Academic Talk and Service

Speaker
- *CDGym: Expandable, Model-Agnostic Cyber Deception Platform* – FloCon, 2024.
- *Demystifying Cyber Deception: Measuring Effectiveness of Game-Theoretic Cyber Deception Strategies* – Quarterly Workshop on Security Information Workers (WSIW), 2021.

External Reviewer
- Shadow Program Committee at IEEE Symposium on Security and Privacy (S&P) – 2021 Winter Session
- Reviewer at ACM Conference on Data and Application Security and Privacy (CODASPY) – 2017, 2020

Teaching

Guest Lecturer: Computer and Network Forensics 2019 – 2023

- Provided a lecture in CSE 469 class on Malware Forensics and Application of Blockchain at Arizona State University.

Teaching Assistant: Arizona State University

- Computer and Network Forensics (CSE 469): Spring 2021
- Introduction to Engineering (FSE 100): Fall 2014, 2015

Honors and Rewards

CyberCorps: Scholarship for Service Jan 2025

- U.S. Government & National Science Foundation

Cybersecurity Fellowship Aug 2019

- School of Computing, Informatics and Decision Systems Engineering
  Arizona State University

Most Innovative Capability Award in Blockchain Innovation Challenge May 2019

- Research Enterprise
  Arizona State University & U.S. Airforce

Work Experience

Graduate Research Assistant Aug 2015 – Present
Arizona State University *Tempe, AZ*

- Conduct and manage security and vulnerability analysis of next-generation network technologies including 5G/6G Network slicing, Software-defined networking (SDN), and Network function virtualization (NFV) in the Laboratory of Security Engineering for Future Computing (SEFCOM).
- Published multiple research papers in the area of network security.

Graduate II - Cyber Security Intern Jan 2022 – May 2023
National Renewable Energy Laboratory (NREL) *Golden, CO*

- Designed, deployed, configured, and maintained 5G radio access network (RAN) and core network (CN) for energy grid.
- Facilitated security assessment of the RAN and CN components in support of the research initiative.

Researcher Aug 2015 – Aug 2016
Intel Corporation *Chandler, AZ*

- Performed cryptographic performance assessment and verification of Intel QuickAssist Technology (QAT) on Open Network Platform, compatibility and functionality investigation of Intel QAT with HTTP/2.
- Developed educational curriculum for SDN/NFV at Arizona State University.

Technical Skills

Languages: Python, C/C++, R, Rust
Frameworks: Open Source MANO, Open Air Interface, Open Network Operating System, Open5GS
Tools: Git, Docker, USRP software defined radio
Libraries: DPDK, TensorFlow, PyTorch, pandas, NumPy, Matplotlib
Standards: ETSI-NFV, 3GPP, NGMN

References

Dr. Gail-Joon Ahn 480-965-9007 | gahn@asu.edu

- Professor
  Director, Center for Cybersecurity and Digital Forensics
  Arizona State University

Dr. Jaejong Baek 808-462-9288 | jaejong@asu.edu

- Assistant Teaching Professor
  School of Computing and Augmented Intelligence
  Arizona State University