

# Hyeonmin Lee

## Network Security Researcher

✉ min0921110@gmail.com

🔗 [hyeonmin-lee.github.io](https://hyeonmin-lee.github.io)  
📄 [hyeonminlee1110](https://hyeonminlee1110.github.io)

I am a postdoctoral researcher at Seoul National University. My research interests lie in network security including DNS security, Email security, and TLS. I have participated in (or led) more than ten research projects with institutions such as Virginia Tech, Rochester Institute of Technology, University of Twente, SIDN Labs, NLnet Labs, etc.

### PROFESSIONAL EXPERIENCE

**Postdoctoral Researcher**, Network Convergence and Security Lab  
*Seoul National University*

**Apr 2022 — Present**  
*Seoul, South Korea*

**Visiting Student**, The Center for Cybersecurity  
*Rochester Institute of Technology*

**May 2019 — Aug 2019**  
*Rochester, NY, United States*

### EDUCATION

**Ph.D., Computer Science and Engineering**, Seoul National University, (Seoul, South Korea)

**Mar 2016 — Feb 2022**

- [Ph.D. Thesis] “Understanding the DANE Ecosystem in Email: How Is It Deployed and Managed?”
- [Advisors] *Prof. Taekyoung “Ted” Kwon (Seoul National University) and Prof. Taejoong “Tijay” Chung (Virginia Tech)*

**B.S., Computer Science and Engineering**, Seoul National University, (Seoul, South Korea)

**Mar 2011 — Feb 2016**

**Visiting Student, Information Technology**, Uppsala University, (Uppsala, Sweden)

**Fall 2014**

### PUBLICATIONS (SELECTED)

**ZTLS: A DNS-based Approach to Zero Round Trip in TLS handshake**

**TheWebConf’23**

- Sangwon Lim, **Hyeonmin Lee**, Hyunsoo Kim, Hyunwoo Lee, Ted “Taekyoung” Kwon
- In Proceedings of the ACM Web Conference 2023, Austin, United States, Apr 2023

**Under the Hood of DANE mismanagement in SMTP**

**USENIX Security’22**

- **Hyeonmin Lee**, Md. Ishtiaq Ashiq, Moritz Müller, Roland van Rijswijk-Deij, Taekyoung “Ted” Kwon, Taejoong Chung
- In Proceedings of the 31st USENIX Security Symposium, Boston, United States, Aug 2022

**A Longitudinal and Comprehensive Study of the DANE Ecosystem in Email**

**USENIX Security’20**

- **Hyeonmin Lee**, Aniketh Gireesh, Roland van Rijswijk-Deij, Taekyoung “Ted” Kwon, Taejoong Chung
- In Proceedings of the 29th USENIX Security Symposium, Boston, United States, Aug 2020

**Method for Performing Mutual Authentication in Communication using Locator ID Separation Protocol, Apparatus, and System for Performing the Same** **Patent**

- Ted “Taekyoung” Kwon, **Hyeonmin Lee**, Hyunwoo Lee
- Registration No. 10-2476081, South Korea, Dec 2022

### RESEARCH PROJECT EXPERIENCE (SELECTED)

**A Study for the Future-oriented DANE-based Web Architecture to Solve Problems in the Current TLS-based Web Ecosystem**

*Primary Investigator*

**Sep 2022 – Present**

(Funded by *Basic Science Research Program - National Research Foundation of Korea (NRF)*)

- [Role] As a primary investigator, I am conducting an overall project. I analyze how the Web ecosystem will be changed if the Web adopts the DANE protocol for communication peer authentication.
- [Keywords] Web, Transport Layer Security (TLS), Authentication, DANE

**Research on Secure DNS and Privacy aware Packet Filtering Technology**

*System Designer, Programmer*

**Aug 2022 — Present**

(Funded by *Samsung Electronics*)

- [Role] As a postdoctoral researcher, my role is to investigate a way to filter packets using DNS packets and implement it on BIND9.
- [Keywords] Domain Name System, DNS over TLS (DoT), DNS over HTTPS (DoH), Packet filtering.

**Abnormal Detection and Forensic Techniques using IoT Network Traffic Analysis**

*Project Manager, System Designer, Programmer*

**Mar 2021 — Nov 2021**

(Funded by *Korea Institute of Information Security & Cryptology (KIISC)*)

- [Role] As a doctoral student, I took on the role of project manager and designed the entire system aimed at detecting anomalies or attacks in IoT networks. In addition to designing the system, I implemented an autoencoder model to distinguish between abnormal and normal IoT network traffic.
- [Keywords] Internet of Things (IoT), Machine learning, Abnormal detection.

### SKILLS

**Tools and Languages**

Python (proficient), C/C++, Java, Go, Spark, Hadoop, Git,  $\text{\LaTeX}$ , Linux OS

**Knowledge Background**

DNS, DNS Security (i.e., DNSSEC, DoT, DoH), SMTP, Email Security (i.e., STARTTLS), PKI, DANE, TLS, IoT, Edge computing

**Communication**

English, Korean (native)