Hyeonmin Lee

Postdoctoral Researcher at Seoul National University

I'm a postdoctoral researcher at Seoul National University, working with Taekyoung "Ted" Kwon. I received my Ph.D. and B.S. in Computer Science and Engineering from Seoul National University, supervised by Prof. Taekyoung "Ted" Kwon (Seoul National University) and Prof. Taejoong "Tijay" Chung (Virginia Tech). My research interests lie in network security and its measurement: Are we using the network correctly and securely? How can we make the network (more) secure?

Contact Information

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Address:	Network Convergence and Security Lab, 5F, Building 301, 1, Gwanak-ro, Gwanak-gu, Seoul, South Korea (08826)
Homepage:	https://hyeonmin-lee.github.io/

Research Interests

Network Security — (especially) DNS security, Mail security
Security Measurement

Positions

Apr 2022 - Present | **Postdoctoral Researcher**, Seoul National University, Seoul, South Korea
- Supervisor: Prof. Taekyoung "Ted" Kwon

Education

Mar 2016 - Feb 2022 | **Ph.D.**, Computer Science and Engineering, Seoul National University, Seoul, South Korea
- Dissertation: "Understanding the DANE Ecosystem in Email: How Is It Deployed and Managed?"
- Laboratory: Network Convergence and Security Lab.
- Supervisors: Prof. Taekyoung "Ted" Kwon and Prof. Taejoong (Tijay) Chung

Mar 2011 - Feb 2016 | **B.S.**, Computer Science and Engineering, Seoul National University, Seoul, South Korea

Fall 2014 | **Visiting Student**, Information Technology, Uppsala University, Uppsala, Sweden

Publications

[C3] **Under the Hood of DANE Mismanagement in SMTP**
Hyeonmin Lee, Md. Ishtiaq Ashiq, Moritz Müller, Roland van Rijswijk-Deij, Taekyoung "Ted" Kwon, Taejoong Chung
In Proceedings of the 31st USENIX Security Symposium (**Security'22**),
Boston, United States, Aug 2022
– Dataset [https://dane-study.github.io]

[p1] **A Longitudinal and Comprehensive Study of the DANE Ecosystem in Email (Poster)**
Hyeonmin Lee, Md. Ishtiaq Ashiq, Moritz Müller, Roland van Rijswijk-Deij, Taekyoung "Ted" Kwon, Taejoong Chung
Poster Session in the 31st USENIX Security Symposium (**Security'22**),
Boston, United States, Aug 2022

[c2] **A Longitudinal and Comprehensive Study of the DANE Ecosystem in Email**
Hyeonmin Lee, Aniketh Gireesh, Roland van Rijswijk-Deij, Taekyoung "Ted" Kwon, Taejoong Chung
In Proceedings of the 29th USENIX Security Symposium (**Security'20**),
Boston, United States, Aug 2020
– Dataset [https://dane-study.github.io]

[c1] **Development of Cellular Core Network Enabling Network Function Virtualization**
Hyeonmin Lee, Junghwan Song
The 28th Joint Conference on Communication and Information (**JCCI'18**),
Yeosu, Korea, May 2018

[j1] **TwinPeaks: An Approach for Certificateless Public Key Distribution for the Internet and Internet of Things**
Eunsang Cho, Jeongnyeo Kim, Minkyung Park, **Hyeonmin Lee**, Chorom Hamm, Soobin Park, Sungmin Sohn, Minhyeok Kang, Ted "Taekyoung" Kwon
Elsevier Computer Networks (SCI-E)

Professional Experiences

Mar 2016 - Feb 2022
Research Assistant
Network Convergence and Security Lab., Seoul National University, Seoul, South Korea
[Research Topic]
- Measuring how DANE is deployed in the SMTP ecosystem
  (Related achievement - Publication [c2])
- Investigating the underlying reasons for the DANE mismanagement
  (Related achievement - Publication [c3])

May 2019 - Aug 2019
Visiting Researcher
The Center for Cybersecurity, Rochester Institute of Technology, Rochester, USA
[Research Topic]
- Measuring and analyzing the ecosystem of DANE protocol in Email
  (Related achievement - Publication [c2]

Spring 2016
Teaching Assistant
Dept. of Computer Science and Engineering, Seoul National University, Seoul, Korea
- Engineering Frontiers and Leadership 2 Class

Research Project Experiences

Aug 2022 - Present
Research on Secure DNS and Privacy aware Packet Filtering Technology
- Supported by Samsung Electronics
- Role: Researcher / Programmer

Apr 2020 - Dec 2021
Research on Traceability for Data Stability on Cloud-edge Lifecycle
- Supported by Institute for Information and Communication Technology Promotion (IITP)

- Role: Researcher / Programmer

Mar 2021 - Nov 2021

Abnormal Detection and Forensic Techniques using IoT Network Traffic Analysis
- Supported by Korea Institute of Information Security & Cryptology (KIISC)
- Role: Project Manager (Lab.) / Researcher / Programmer

Apr 2016 - Dec 2020

Versatile Network System Architecture for Multi-dimensional Diversity
- Supported by Institute for Information and Communication Technology Promotion (IITP)
- Role: Project Manager (Lab.) / System Designer / Programmer

Aug 2016 - Feb 2019

Research and Development of Open 5G Reference Model
- Supported by Giga KOREA Foundation
- Role: System Designer / Programmer

Jul 2015 - Dec 2015

Development of Network Security Acceleration for Next-generation Low-power SoC
- Supported by Samsung Electronics
- Role: Programmer

Patents

- **Network System and Method for Performing Message Security Thereof**
  Ted "Taekyoung" Kwon, Hyunwoo Lee, Myungchul Kwak, **Hyeonmin Lee**, Junghwan Lim, Yoojung Shin
  - Registration No. 1022656110000
  - South Korea, Jun. 10, 2021
- **Communication Method Based on Integrated Flat ID and System**
  Ted "Taekyoung" Kwon, Hyunwoo Lee, Myungchul Kwak, **Hyeonmin Lee**, Dongjun Lee, Hyunchul Oh
  - Registration No. 1020231150000
  - South Korea, Sep. 11, 2019

Awards & Fellowships

- Aug 2018, **Seoul National University Alumni Association Scholarship**
- Fall 2014, **Exchange Student Program to Uppsala University (Information Technology)**

Talks & Presentations

- Aug 2020, USENIX Security, Online, "A Longitudinal and Comprehensive Study of the DANE Ecosystem in Email"
  – Slides [link], Video [link]

Miscellaneous

Mar 2019 - Feb 2022

Expert Research Personnel (military service)
Seoul National University, Seoul, South Korea
The expert research personnel system is a form of alternative military service in South Korea, where the military service is fulfilled by conducting research at a domestic university or company for three years. I had not been involved in any military research project throughout the service.

References

Taekyoung "Ted" Kwon (tkkwon@snu.ac.kr)

- Professor, Department of Computer Science and Engineering, Seoul National University, Seoul, South Korea

Taejoong (Tijay) Chung (tijay@vt.edu)

- Assistant Professor, Department of Computer Science, Virginia Tech, Blacksburg, VA, United States