Hyeonmin Lee

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RESEARCH INTERESTS

○ **Network security**: Securing Internet infrastructure through *data-driven security analysis*, *protocol development and optimization*, and *threat mitigation*.
○ **Key Topics**: Domain Name System (DNS), Public Key Infrastructure (PKI), Transport Layer Security (TLS), and Email security.

EDUCATION

Ph.D., Computer Science and Engineering, *Seoul National University*, Seoul, South Korea   **Mar 2016 — Feb 2022**
○ Advisors: Prof. Taekyoung "Ted" Kwon and Prof. Taejoong (Tijay) Chung (co-advisor, *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**

PROFESSIONAL EXPERIENCE

Postdoctoral Research Associate, Department of Computer Science   **Oct 2023 — Dec 2025**
University of Virginia   *Charlottesville, VA, USA*
○ Supervisor: Prof. Yixin Sun

Postdoctoral Researcher, Department of Computer Science and Engineering   **Apr 2022 — Sep 2023**
Seoul National University   *Seoul, South Korea*
○ Supervisor: Prof. Taekyoung "Ted" Kwon

Visiting Student, The Center for Cybersecurity   **May 2019 — Aug 2019**
Rochester Institute of Technology   *Rochester, NY, USA*
○ Supervisor: Prof. Taejoong (Tijay) Chung

PUBLICATIONS (C: CONFERENCE | J: JOURNAL | P: POSTER)

[C11] RFCScope: Detecting Logical Ambiguities in Internet Protocol Specifications   *ASE'25*
Mrigank Pawagi, Lize Shao, **Hyeonmin Lee**, Yixin Sun, and Wenxi Wang   `Top Conference`
In Proceedings of the 40th IEEE/ACM International Conference on Automated Software Engineering, Seoul, South Korea, Nov 2025
- Artifact: https://github.com/HIPREL-Group/RFCScope/

[C10] Inside Certificate Chains Beyond Public Issuers: Structure and Usage Analysis from   *IMC'25*
a Campus Network   `Top Conference`
Hongying Dong, Yizhe Zhang, **Hyeonmin Lee**, and Yixin Sun
In Proceedings of the 2025 ACM Internet Measurement Conference, Madison, Wisconsin, USA, Oct 2025
- Artifact: https://keyinfra.cs.virginia.edu/cert_chain/

[C9] PQTLS-AD: Post-Quantum TLS Accelerated with DNS   *ICCCN'25*
Sangwon Lim, **Hyeonmin Lee**, Gyeongheon Jeong, and Taekyoung Kwon
In Proceedings of the 34th International Conference on Computer Communications and Networks, Tokyo, Japan, Aug 2025

[C8] PAVE: Information Flow Control for Privacy-preserving Online Data Processing Services   *ASPLOS'25*
Minkyung Park, Jaeseung Choi, **Hyeonmin Lee**, and Taekyoung Kwon   `Top Conference`
In Proceedings of the 30th ACM International Conference on Architectural Support for Programming Languages and Operating Systems, Rotterdam, Netherlands, Mar 2025

[C7] Exploring the Ecosystem of DNS HTTPS Resource Records: An End-to-End Perspective   *IMC'24*
Hongying Dong, Yizhe Zhang, **Hyeonmin Lee**, Shumon Huque, and Yixin Sun   `Top Conference`

In Proceedings of the 2024 ACM Internet Measurement Conference, Madrid, Spain, Nov 2024
- Artifact: https://keyinfra.cs.virginia.edu/dns_http/

[C6] Mutual TLS in Practice: A Deep Dive into Certificate Configurations and Privacy Issues   *IMC'24*
    Hongying Dong, Yizhe Zhang, **Hyeonmin Lee**, Kevin Du, Guancheng Tu, and Yixin Sun   `Top Conference`
    In Proceedings of the 2024 ACM Internet Measurement Conference, Madrid, Spain, Nov 2024
     - Artifact: https://keyinfra.cs.virginia.edu/mutual_tls/

[C5] DDD: A DNS-based DDoS Defense Scheme Using Puzzles   *ICCCN'24*
    Hyeonmin Lee, Taehyun Kang, Sukhun Yang, Jinyong Jun, and Taekyoung Kwon
    In Proceedings of the 33rd International Conference on Computer Communications and Networks, Big Island, Hawaii, USA, Jul 2024
     - Artifact: https://github.com/Sagit25/DNS-based-DDoS-mitigation

[C4] ZTLS: A DNS-based Approach to Zero Round Trip in TLS handshake   *TheWebConf (WWW)'23*
    Sangwon Lim, **Hyeonmin Lee**, Hyunsoo Kim, Hyunwoo Lee, and Ted "Taekyoung" Kwon   `Top Conference`
    In Proceedings of the ACM Web Conference 2023 (formerly WWW), Austin, USA, Apr 2023
     - Artifact: https://zenodo.org/records/7597964

[C3] Under the Hood of DANE Mismanagement in SMTP   *USENIX Security'22*
    Hyeonmin Lee, Md. Ishtiaq Ashiq, Moritz Müller, Roland van Rijswijk-Deij, Taekyoung "Ted"   `Top Conference`
    Kwon, and Taejoong Chung
    In Proceedings of the 31st USENIX Security Symposium, Boston, USA Aug 2022
     - Artifact: https://dane-study.github.io/security2022/security2022-abstract/

[C2] 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, and Tae-   `Top Conference`
    joong Chung
    In Proceedings of the 29th USENIX Security Symposium, Boston, USA, Aug 2020
     - Artifact: https://dane-study.github.io/security2020/security2020-abstract/

[C1] Development of Cellular Core Network Enabling Network Function Virtualization   *JCCI'18*
    Hyeonmin Lee, Junghwan Song, and Taekyoung Kwon
    The 28th Joint Conference on Communications and Information, Yeosu, South Korea, May 2018

[J1] TwinPeaks: An Approach for Certificateless Public Key Distribution for the Internet and   *Computer Networks*
    Internet of Things   `SCIE`
    Eunsang Cho, Jeongnyeo Kim, Minkyung Park, **Hyeonmin Lee**, Chorom Hamm, Soobin Park, Sungmin Sohn, Minhyeok Kang, and Ted "Taekyoung" Kwon
    Elsevier Computer Networks, Jul 2020

[P1] A Longitudinal and Comprehensive Study of the DANE Ecosystem in Email   *USENIX Security'22*
    Hyeonmin Lee, Md. Ishtiaq Ashiq, Moritz Müller, Roland van Rijswijk-Deij, Taekyoung "Ted" Kwon, and Tae-joong Chung
    Poster Session in the 31st USENIX Security Symposium, Boston, USA, Aug 2022

GRANT

A Study for the Future-oriented DANE-based Web Architecture to Solve Problems in the Current TLS-based Web Ecosystem
Primary Investigator / Researcher   Sep 2022 — Aug 2023
(Funded by *Basic Science Research Program - National Research Foundation of Korea*, ₩60,000,000 ≈ $46,000)
- ○ [Goal] This project aimed to investigate the potential challenges (e.g., delay) and impacts of adopting the DANE protocol for peer authentication within the Web ecosystem.
- ○ [Keywords] Web, Transport Layer Security (TLS), Authentication, DANE

PATENTS

Homomorphic Cryptographic Parallel Computation Method and Computing Device Performing the Same Method

- ○ Taekyoung Kwon, Minkyung Park, Minhyeok Kang, Selin Chun, **Hyeonmin Lee**
- ○ Registration No. 10-2513552, South Korea, Mar 2023

Method for Performing Mutual Authentication in Communication using Locator ID Separation Protocol, Apparatus, and System for Performing the Same
- ○ Taekyoung Kwon, **Hyeonmin Lee**, Hyunwoo Lee
- ○ Registration No. 10-2476081, South Korea, Dec 2022

Network System and Method for Performing Message Security Thereof
- ○ Taekyoung Kwon, Hyunwoo Lee, Myungchul Kwak, **Hyeonmin Lee**, Junghwan Lim, Yoojung Shin
- ○ Registration No. 10-2265611, South Korea, Jun 2021

Communication Method Based on Integrated Flat ID and System
- ○ Taekyoung Kwon, Hyunwoo Lee, Myungchul Kwak, **Hyeonmin Lee**, Dongjun Lee, Hyunchul Oh
- ○ Registration No. 10-2023115, South Korea, Sep 2019

Talks & Presentations

APNIC Blog, Online post, "Under the hood of DANE mismanagement in SMTP"	Sep 2022
USENIX Security, Boston, MA "Under the Hood of DANE Mismanagement in SMTP"	Aug 2022
USENIX Security, Online, "A Longitudinal and Comprehensive Study of the DANE Ecosystem in Email"	Aug 2020

Professional Services

Program Committee Member
- ○ *Applied Cryptography and Network Security (ACNS) · 2026*

Reviewer
- ○ *ACM SIGCOMM Computer Communication Review (CCR) · 2025*
- ○ *Journal of Communications and Networks (JCN) · 2025*
- ○ *IEEE Network · 2024*
- ○ *IEEE/ACM Transactions on Networking (ToN) · 2024, 2025*
- ○ *IEEE Transactions on Network and Service Management (TNSM) · 2024, 2025*

External Reviewer
- ○ *Network and Distributed System Security Symposium (NDSS) · 2025*

Teaching Experience

Teaching Assistant, Engineering Frontiers and Leadership (M2177.000600), Seoul National University, Spring 2016

References

Taekyoung "Ted" Kwon
- ○ Professor
- ○ Department of Computer Science and Engineering, Seoul National University, Seoul, South Korea
- ○ Email: tkkwon@snu.ac.kr

Taejoong (Tijay) Chung
- ○ Associate Professor
- ○ Department of Computer Science, Virginia Tech, Blacksburg, VA, USA
- ○ Email: tijay@vt.edu

Yixin Sun
- ○ Assistant Professor
- ○ Department of Computer Science, University of Virginia, Charlottesville, VA, USA
- ○ Email: ys3kz@virginia.edu