Dongkeun Lee

dklee98@korea.ac.kr | https://codongcodong.github.io | https://github.com/codongcodong

Education

Korea University — *Seoul, Republic of Korea*
Ph.D. student in Cybersecurity, School of Cybersecurity (SCS) — *Sept. 2023 - Present*
- Academic advisor: Prof. Wonjun Lee

Korea University — *Seoul, Republic of Korea*
B.Eng. in Dept. of Cyber Defense (CYDF), Division of Information Security — *Mar. 2018 - Feb. 2022*
- Overall GPA: 4.29/4.50

National University of Singapore — *Singapore*
Exchange student — *Aug. 2019 - Dec. 2019*

Research Interests

Cyber Security
- web security, data privacy, third-party tracking, encrypted traffic classification

User Experience
- video streaming, enhancing quality of experience (QoE), analyzing and modeling user behavior

Publications

Conference Proceedings

[1] **Dongkeun Lee**, Minwoo Joo, and Wonjun Lee, "Net-track: Generic Web Tracking Detection Using Packet Metadata," in *Proceedings of the ACM Web Conference 2023* **(WWW '23)**, Austin, TX, USA, April-May 2023.

Journal Publications

[1] **Dongkeun Lee**, Minwoo Joo, and Wonjun Lee, "Qrator: An Interest-aware Approach to ABR Streaming Based on User Engagement," *IEEE Systems Journal*, Vol. 16, No. 4, pp. 6581 – 6589, December 2022.

Work Experience

Aug. 2022 - Present — **Cyber Officer**, Cyber Operations Command, Republic of Korea Armed Forces
- Developed techniques for advanced cyberspace operations
- Managed cyber threats against military assets via malicious code analysis and traffic anomaly detection

Aug. 2020 - Mar. 2022 — **Research Intern**, Network and Security Research Lab at Korea University, Seoul, Republic of Korea
- Supervisor: Prof. Wonjun Lee
- Topic: Multimedia networking, Network security and privacy

Teaching Experience

Spring 2021 — **Computer Networks**, Teaching Assistant, Korea University, Seoul, Republic of Korea

Research Projects

Discovering unknown third-party trackers in the wild — *Korea University*
Advisor: Prof. Wonjun Lee — *Seoul, Republic of Korea*
Keywords: web security, third-party tracking, encrypted traffic analysis, machine learning — *Mar. 2021 - Present*

- Built a high accuracy web tracking detection system,"Net-track"
- Implemented Net-track using diverse machine learning models with **Scikit-learn** and **Tensorflow**
- Collected 350k traffic traces by visiting top-20k Alexa websites using **Selenium**

Understanding the impact of user engagement on QoE in video streaming — *Korea University*
Advisor: Prof. Wonjun Lee — *Seoul, Republic of Korea*
Keywords: QoE, multimedia, ABR streaming, user modeling — *Oct. 2020 - Nov. 2021*

- Collected and analyzed user comments in real YouTube videos with **Selenium**
- Validated the feasibility of obtaining user interest information from user engagement data
- Proposed "Qrator", the first ABR streaming system that leverages *timestamps* and *likes* in video comments

Publications (Domestic)

[1] **Dongkeun Lee**, Minwoo Joo, and Wonjun Lee, "Network-level Tracker Detection Using Features of Encrypted Traffic (암호화된 트래픽의 특성을 활용한 네트워크 단위 트래커 탐지 기법)," *Journal of KIISE: Information Networking*, Vol. 49. No. 4, pp. 314-320, April 2022. (**Selected as an Outstanding Paper Award**)

[2] **Dongkeun Lee**, Minwoo Joo, and Wonjun Lee, "Feature Analysis of Encrypted Traffic for Network-level Tracker Detection (네트워크 단위 트래커 탐지를 위한 암호화된 트래픽의 특성 분석)," in *Proceedings of the KIISE Korea Computer Congress 2021 (KIISE KCC2021)*, Jeju, Republic of Korea, June 2021, pp. 1-3. (**Selected as an Outstanding Paper Award**)

[3] **Dongkeun Lee**, Minwoo Joo, and Wonjun Lee, "User Engagement Based Adaptive Streaming Using Timestamps in Video Comments (비디오 댓글의 타임스탬프를 활용한 사용자 참여 기반 적응적 스트리밍 기법 연구)," in *Proceedings of the KIISE Korea Software Congress 2020 (KIISE KSC2020)*, Pyeongchang, Republic of Korea, December 2020, pp. 1-3.

Honors and Awards

Scholarships

Mar. 2018 - Feb. 2022	**The National Scholarship for Science and Engineering**, Korea Student Aid Foundation	*$ 10k/year in total*
Mar. 2018 - Feb. 2022	**Military Scholarship**, Ministry of National Defense, Republic of Korea	*$ 10k/year in total*

Awards

June 2023	**Outstanding Paper Award**, Journal of KIISE: Information Networking, KIISE
June 2021	**Outstanding Paper Award**, Korea Computer Congress 2021, KIISE

Languages

English (Fluent, TOEFL: 102/120), **Korean** (Native)