# Dongkeun Lee

✉ dklee98@korea.ac.kr | 🏠 codongcodong.github.io | ⬜ codongcodong | in dongkeun-lee

## Education

**Korea University** *Seoul, Republic of Korea*
PH.D. STUDENT IN CYBERSECURITY, SCHOOL OF CYBERSECURITY *Sept. 2023 - Present*
- Academic advisor: Prof. Wonjun Lee

**Korea University** *Seoul, Republic of Korea*
B.ENG. IN CYBER DEFENSE, DIVISION OF INFORMATION SECURITY *Mar. 2018 - Feb. 2022*
- Overall GPA: 4.29/4.50

**National University of Singapore** *Singapore*
UNDERGRADUATE EXCHANGE STUDENT *Aug. 2019 - Dec. 2019*

## Research Interests

**Architectural Support for AI**
- serverless, edge computing, inference serving, generative models

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

## Publications

### CONFERENCE PROCEEDINGS

[C2] <u>Dongkeun Lee</u> and Wonjun Lee, "Learning Prompt-Level Quality Variance for Cost-Effective Text-to-Image Generation," in *Proceedings of the 33rd ACM International Conference on Information and Knowledge Management* **(CIKM '24)**, Boise, ID, USA, October 2024.
(Short Paper, Acceptance Rate: 26.8%=141/527)

[C1] <u>Dongkeun Lee</u>, 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.
(Acceptance Rate: 19.2%=365/1900)

### JOURNAL PUBLICATIONS

[J1] <u>Dongkeun Lee</u>, 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.
(2021 JCR I/F: 4.802; Top 25.36% Impact Factor in Engineering, Electrical & Electronic)

## 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

**Enhancing the cost-effectiveness of text-to-image generation**                    *Korea University*
ADVISOR: PROF. WONJUN LEE                                                            *Seoul, Republic of Korea*
**Keywords**: multimedia systems, text-to-image generation, diffusion models        *Jan. 2024 - June 2024*
- Analyzed the relationship between linguistic features of prompts and generation quality across diverse text-to-image models including **Stable Diffusion**
- Proposed a cost-effective, quality-driven model selection approach that leverages the strengths of multiple generative models and implemented it with **PyTorch**, achieved 29.25% cost reduction
- Conducted as part of the project: Service Continuity-Oriented Edge Continuum SW Framework **(Sco-Edge)**

**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 - Jan. 2023*
- Built a high accuracy web tracking detection system,"Net-track"
- Collected 350k traffic traces by visiting top-20k Alexa websites using **Selenium**
- Implemented Net-track using **Scikit-learn** and **TensorFlow**, achieved 0.94 accuracy and discovered new trackers yet unrecognized by existing flter lists

**Understanding the impact of user engagement on QoE in video streaming**            *Korea University*
ADVISOR: PROF. WONJUN LEE                                                            *Seoul, Republic of Korea*
**Keywords**: QoE, multimedia systems, 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)

[3] <u>Dongkeun Lee</u>, 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.
(KCI Journal, *Selected as an Outstanding Paper Award*)

[2] <u>Dongkeun Lee</u>, 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*)

[1] <u>Dongkeun Lee</u>, 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

| | |
|---|---|
| Feb. 2025 | **Outstanding Paper Award**, Korea University Graduate School |
| 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)