

Dongkeun Lee

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Education

Korea University

PH.D. STUDENT IN CYBERSECURITY, SCHOOL OF CYBERSECURITY (SCS)

- Academic advisor: Prof. Wonjun Lee

Seoul, Republic of Korea

Sept. 2023 - Present

Korea University

B.ENG. IN DEPT. OF CYBER DEFENSE (CYDF), DIVISION OF INFORMATION SECURITY

- Overall GPA: 4.29/4.50

Seoul, Republic of Korea

Mar. 2018 - Feb. 2022

National University of Singapore

EXCHANGE STUDENT

Singapore

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] Dongkeun Lee 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. (to appear)
(Short Paper, Acceptance Rate: 26.8%=141/527)

[C1] 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.
(Acceptance Rate: 19.2%=365/1900)

JOURNAL PUBLICATIONS

[J1] 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

Enhancing the cost-effectiveness of text-to-image generation Korea University
Seoul, Republic of Korea
Jan. 2024 - Jun. 2024
ADVISOR: PROF. WONJUN LEE

Keywords: multimedia systems, text-to-image generation, diffusion models

- 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
Seoul, Republic of Korea
Mar. 2021 - Jan. 2023
ADVISOR: PROF. WONJUN LEE

Keywords: web security, third-party tracking, encrypted traffic analysis, machine learning

- 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 filter lists

Understanding the impact of user engagement on QoE in video streaming Korea University
Seoul, Republic of Korea
Oct. 2020 - Nov. 2021
ADVISOR: PROF. WONJUN LEE

Keywords: QoE, multimedia systems, ABR streaming, user modeling

- 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] 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.
(KCI Journal, *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*)
- [1] 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)