Dongkeun Lee

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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 Dept. of 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] 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.
(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.
(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] 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

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)