Dongwook Kwon

AI Researcher

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Education

Jan 2025 - Present

Graduate Research Exchange Program

University of Toronto

Mar 2024 - Present

Master of Science in Computer Engineering

Kwangwoon University, Seoul, Korea

GPA: 4.33/4.5 (Percentage: 98.1%)

Mar 2019 - Feb 2024

Bachelor of Science in Electronics and Communications Engineering

Kwangwoon University, Seoul, Korea

GPA: 3.41/4.5 (Percentage: 88.1%)

Work Experience

Jan 2025 - Present

Research Project

LG Electronics Canada, Toronto, Ontario, Canada

- Participating in the development of an assessment framework for agentic AI systems utilizing LLMs to evaluate performance

Aug 2021 - Present

Research Assistant

Bio-Computing and Machine Learning Laboratory

- Conducted research on deep learning algorithms, focusing on anomaly detection in time series data, including Electrocardiogram (ECG) and Cyber-Physical Systems (CPS)
- Participated in the development of an Active Kill-Switch and Biomarker-Based Defense System for life-threatening IoT medical devices

Jul 2022 - Aug 2022

AI Development Project, Summer Internship

Qualcomm Institute, University of California, San Diego

- Participated in the Personality-Based Drug Addiction Prediction System project
- Attended seminars on deep learning and machine learning algorithms

Feb 2021 - Dec 2021

Development Project

SK Telecom

- Developed a logistics detection system incorporating location tracking and stack layer identification for containers
- Developed an automated logistics port system using depth camera-based video signal processing and machine learning algorithms

Project Experience

Jan 2025 - Present

Evaluation Frameworks for Agentic AI Systems

LG Electronics Canada, Toronto, Ontario, Canada

Developed an evaluation framework for agentic AI systems using LLMs to assess performance

Jul 2022 - Present

AI-based Intrusion Detection and Attack Packet Crafting Technologies for APR1400

Sejong University, Seoul, Korea

Developed an AI defense system to protect nuclear power plants from cyber attacks, which led to a publication and an outstanding paper award for its application to medical devices

Sep 2021 - Dec 2022

Development of Active Kill-Switch and Biomarker Based Defense System for Life-Threatening IoT Medical Devices

Kookmin University, Seoul, Korea

Developed a security system for heart implant devices using an anomaly detection algorithm, which resulted in a publication and a patent

Apr 2022 - Nov 2022

Quadruped Robot Using Vision SLAM with a Depth Camera

Ministry of Science and ICT, Korean Government

Developed an autonomous quadruped robot using a navigation algorithm with SLAM and a depth camera, which resulted in receiving the University President's Award and the Federation President's Award

Jul 2022 - Aug 2022

Personality-Based Drug Addiction Prediction System

Qualcomm Institute, University of California, San Diego

Developed a personality-based drug addiction prediction system using a machine learning model, which resulted in receiving an Achievement Award

Apr 2021 - Nov 2021

Development of a Smart Logistics System Using Computer Vision

Ministry of Oceans and Fisheries, Korean Government

Developed a logistics detection system that incorporates location tracking and stack layer identification for containers, which resulted in receiving the Korean Minister's Award

May 2021 - Oct 2021

Smart Kitchen IoT System Utilizing Computer Vision and Deep Learning

Kwangwoon University, Seoul, Korea

Developed a cloud IoT platform featuring a system for classifying groceries in the fridge and an OCR receipt program, which resulted in receiving the University President's Award

Sep 2021 - Oct 2021

Kinematic Motion Classification System using Accelerometer and Gyroscope Sensor Data

Kwangwoon University, Seoul, Korea

Developed a kinematic motion classification system using accelerometer and gyroscope sensor data, which resulted in receiving the Director's Award

Publciations

- N. Yusang, J. Lee, J. Lee, H. Lee, **D. Kwon**, M. Yeo, S. Kim, R. Sohn, and C. Park, "Designing a remote photoplethysmography-based heart rate estimation algorithm during a treadmill exercise," *Electronics*, vol. 14, no. 5, p. 890, 2025.
- **D. Kwon**, M. Kim, Y. Kang, J. Lee, and C. Park, "Hybrid neural network model for anomaly detection in implantable devices using graph attention networks and transformers," *in Proc. of the 10th Int. Biomed. Eng. Conf.*, 2024.
- **D. Kwon**, Y. Kang, H. Kim, S. Yoo, and C. Park, "A Dual-Directional Approach to Anomaly Detection in Cyber-Physical Systems," in *Proc. The Institute of Electronics and Information Engineers Summer Annual Conference of IEIE*, 2024.
- J. Yang, J. Kim, J. Lee, H. Ryu, **D. Kwon**, S. Yeo, P. Kim, Y. Kim, J. Lim, H. Yoon, and C. Park, "Metaverse: Design of the Car Price Prediction Model Through a Machine-learning Approach," in *Proc. 2023 IEEE International Conference on Metaverse Computing, Networking and Applications (MetaCom)*, pp. 734-737.
- **D. Kwon**, Y. Kang, J. Yang, and C. Park, "Real-Time Anomaly Detection in Industrial Cyber-Physical Systems Using Deep Learning based Bidirectional GRU," in *Proc. 33rd Artificial Intelligence and Signal Processing Conf.*, 2023, pp. 239-241.
- **D. Kwon**, Y. Kang, and C. Park, "Enhancing Medical Device Security with GNN-GRU Anomaly Detection Model," in *Proc. 62nd KOSOMBE Autumn Conf.*, 2023, pp. 204-205.
- Y. Kang, **D. Kwon**, and C. Park, "Blood Pressure Estimation Based on Graph Convolution Network with Peak to Peak Interval," in *Proc. 62nd KOSOMBE Autumn Conf.*, 2023, pp. 426-428.
- **D. Kwon**, Y. Kang, and C. Park, "Analysis of Reconstruction-Based Multivariate ECG Time-Series Data for Arrhythmia Diagnosis," in *Proc. 60th KOSOMBE Autumn Conf.*, 2022, pp. 425-426.

Awards and Honors

- **Minister of Oceans and Fisheries Award (Gold Medal)**, 2021 Smart Maritime Logistics Project Competition, December 17, 2021
- **Achievement Award,** Qualcomm Institute Artificial Intelligence (AI) Development Project, UC San Diego, August 15, 2022
- **Best Poster Award Silver Winner**, The 10th International Biomedical Engineering Conference, "Hybrid neural network model for anomaly detection in implantable devices using graph attention networks and transformers", November 8, 2024
- **Outstanding Paper Award,** 2023 Fall Conference, Korean Society of Medical and Biological Engineering, "Anomaly Detection Model Using GNN-GRU for Enhancing Medical Device Security", November 11, 2023

- **Kwangwoon University President's Award (Excellence)**, 18th Kwangwoon ICT Exhibition (KWIX), September 29, 2022
- **Kwangwoon University President's Award (Grand Prize)**, 2021 MY (Multi-Y) Capstone Design Competition, October 8, 2021
- **Korea Information Industry Federation Chairman's Award (Bronze)**, 2022 Hanium ICT Mentoring Contest, December 2, 2022
- **Kwangwoon University SW Center Director's Award (Encouragement)**, 2021 AI Hackathon, October 8, 2021
- **Scholarship Recipient**, Kwangwoon University Alumni Association, December 15, 2022

Patents

- **Patent Applicant**, "Categorical Data of Networks-Based Network Anomaly Detection Apparatus and Method Thereof", Application No. KR 10-2024-0110559, August 29, 2024
- **Patent Applicant**, "Method for Implantable Medical Device to Detect Anomaly in Real Time", Application No. KR 10-2022-0164087, November 30, 2022
- **Patent Applicant**, "GPT API-Based Network Anomaly Detection", Application No. KR 10-2023-0139066, October 17, 2023

Leadership Experience

- **President**, Kwangwoon International Student Association, Kwangwoon University
- **Director of Filming and Editing**, Kwangwoon Broadcasting Center (KWBC), Kwangwoon University
- **Class Representative**, Student Council, Department of Electronics and Communications Engineering, Kwangwoon University.
- **Executive Member**, Amateur Radio Club, Kwangwoon University