

Jaebong Lim

School of Computer Science and Engineering,
Pusan National University, Busan 46241, South Korea

EDUCATION

Pusan National University

Pursuing Ph.D. degree (under Ph.D. defense process) in Computer Science and Engineering

Thesis Title: Efficient and Robust Deep Learning Methods for Time-Series Sensor Data

M.S. degree in Computer Science and Engineering, Feb. 2018

Thesis Title: Design and Implementation of Driving Information Extraction System for Driver Behavior Analysis

B.S. degree in Computer Science and Engineering, Feb. 2016

EXPERIENCE

Pusan National University – Advisor: Prof. Yunju Baek

Mar. 2016 ~

Research assistant in Computer Science and Engineering -- Conducted research on **embedded AI systems, low-power tiny devices, and time-series sensor data analysis** for a variety of applications, including real-time driver behavior analysis, embedded audio recognition, and human activity recognition on wearables

Design of embedded Artificial Intelligent (AI) systems for a variety of applications

Neural network compression and real-time inference engine for low-power processors

Implementation of hardware and firmware for low-power, small-form-factor devices

Time-series sensor data analysis and machine learning modeling

Virginia Tech – Advisor: Prof. Dongsam Ha

Sep. 2022 ~ Oct. 2022

Visiting research assistant in Electrical and Computer Engineering -- Conducted research on **embedded AI systems, low-power tiny devices, and time-series sensor data analysis** for the smart farm application, including animal activity recognition

PATENTS

Granted Patents

Y. Baek, **J. Lim**, C. Kim, “Method and Apparatus for Dynamic Power Management of Deep Neural Network Accelerators”, KR102519144, 2023.

Y. Baek, H. Lee, **J. Lim**, “Pain Behavior Monitoring System and Method for Managing Pain Using the Same”, KR102433828, 2022.

Y. Baek, J. Lee, **J. Lim**, “System and Method for Monitoring Vision-based Medical Equipment for Nursing Robots”, KR102443608, 2022.

Y. Baek, **J. Lim**, J. Seo, “Apparatus and Method for Controlling Adaptive Threshold on Motion Sensor in Wearable Device”, KR102212481, 2021.

Y. Baek, **J. Lim**, H. Lee, “Apparatus and Method for Adaptive Heading Reference Search”, KR102314072, 2021.

J. Yang, J. Park, Y. Baek, Y. Chun, **J. Lim**, “Apparatus and System for Acquiring Non-Standard Parameter ID, and the Method Thereof,” US10706643, 2020.

Under Granting Procedure

Y. Baek, **J. Lim**, S. Lee, “Method, Apparatus and System for Driver Identification Considering Variable Driving Styles”.

Y. Baek, **J. Lim**, J. Lee, “An Automated Method, Apparatus and System for Training Keyword Spotter”.

Y. Baek, T. Kim, J. Lee, **J. Lim**, “Embedded Keyword Spotting System considering Noisy Environment”.

PUBLICATIONS

International Journal Papers

J. Lim and Y. Baek, “Joint Framework of Curriculum Learning and Knowledge Distillation for Noise-robust and Small-footprint Keyword Spotting,” *IEEE Access*, Preprint, 2023.

J. Lim, Y. Baek and B. Chae, “Temporal Early Exiting with Confidence Calibration for Driver Identification Based on Driving Sensing Data,” *IEEE Access*, vol. 10, pp. 132095-132107, 2022.

International Conference Proceedings

J. Lim and Y. Baek, “Open-Set Driver Identification System Based on Metric Learning with Driving Situation Awareness,” 26th IEEE International Conference on Intelligent Transportation Systems (ITSC), 2023.

J. Lim and Y. Baek, “User-Defined Keyword Spotting Utilizing Speech Synthesis for Low-Resource Wearable Devices,” 40th IEEE International Conference on Consumer Electronics (ICCE), 2022.

J. Lim, J. Seo and Y. Baek, “CamThings: IoT Camera with Energy-Efficient Communication by Edge Computing based on Deep Learning,” 28th International Telecommunication Networks and Applications Conference (ITNAC), 2018.

B. Kim, J. Seo, **J. Lim**, and Y. Baek, “Poster: Design and Implementation of Driving Information Collection System for Driver Behavior Analysis,” 16th Annual International Conference on Mobile Systems, Applications, and Services (MobiSys), 2016.

B. Kim, S. Son, **J. Lim**, and Y. Baek, "Design and Implementation of Camera Network Platform for Information Exchange using Dual Wireless Interface," 26th International Telecommunication Networks and Applications Conference (ITNAC), 2016.

Domestic Journal Papers

J. Lim, J. Seo, and Y. Baek, “Design and Implementation of an EMG-Based Wrist Band Device with Imperfect Hand Gesture Recognition for Patients,” *The Journal of Korean Institute of Communications and Information Sciences*, vol. 46, no. 12, pp. 2280-2290, 2021.

J. Lim and Y. Baek, "Low-Power Communication Method using On-Device Deep Neural Network for Low-Power Image Recognition System," *The Journal of Korean Institute of Communications and Information Sciences*, vol. 44, no. 8, pp. 1588-1596, 2019.

RESEARCH PROJECTS

Sep. 2023 ~, “Digital-X AIoT Research Center” funded by the Ministry of Science and ICT (MSIT), Korea.

- Developed low-power tiny devices with a built-in AI model for keyword spotting and sound event detection
- Research collaborations with LG Electronics

Apr. 2021 ~ Dec. 2024, “Development of Robot System Capable of Assisting Nursing and Monitoring Patients in the Infection Isolation Ward” funded by the Ministry of Trade, Industry & Energy (MOTIE), Korea

- Developed and radar sensors and wearables for human activity recognition : Fall detection and pain protective action recognition
- Collaborations with the Pusan National University Hospital (PNUH)

Apr. 2021 ~ Mar. 2022, “Development of Voice Interface based on Embedded AI for Safety Working Environment” funded by the Ministry of Science and ICT (MSIT), Korea.

- Developed low-power tiny devices with a built-in AI model for keyword spotting and sound event detection
- Research collaborations with the heavy industries

Jun. 2020 ~ May 2021, “Development of OBD-based Vehicle Location Estimation Device and System by Embedded AI” funded by the Ministry of Science and ICT (MSIT), Korea.

- Developed real-time driving analysis systems based on in-vehicle sensor data: In-vehicle sensor data extraction, driving pattern recognition, anomaly driving recognition, and driver identification
- Research collaborations with the automotive industry (SureSoft and OPELSolution)

Apr. 2020 ~ Mar. 2021, “Development of Machine Learning Based Ultra-Small Module for Local Voice Recognition” funded by the Ministry of Science and ICT (MSIT), Korea.

- Developed low-power tiny devices with a built-in AI model for keyword spotting and sound event detection
- Research collaborations with the heavy industries

Apr. 2018 ~ Dec. 2021, “Development of IoT-based Assistive Robot Systems for Personalized Healthcare” funded by the Ministry of Trade, Industry & Energy (MOTIE), Korea

- Developed and radar sensors and wearables for human activity recognition : Fall detection and pain protective action recognition
- Collaborations with the Pusan National University Hospital (PNUH)

Mar. 2016 ~ Oct. 2020, “Smart IT Convergences System Technologies” funded by the Ministry of Science and ICT (MSIT), Korea.

- Developed real-time driving analysis systems based on in-vehicle sensor data: In-vehicle sensor data extraction, driving pattern recognition, anomaly driving recognition, and driver identification
- Research collaborations with the automotive industry (SureSoft and OPELSolution)