Jiwoon Lee

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Education

Kwangwoon University Feb 2019 – Aug 2024
Bachelor of Science in Computer Engineering, Major in Computer Engineering *Seoul, Republic of Korea*

- Opensource Spiking Neural Network Accelerator for FPGA
- Text-To-Speech using Melspectrogram and Generative Adversarial Network

Advisor: Prof. Cheolsoo Park

Research Interests

Computational neuroscience, signal processing, brain-computer interface, statistical machine learning

PUBLICATIONS

- H. Yu†, S. Baek†, **J. Lee**†, I. Sohn, B. Hwang*, C. Park* (accepted). "Deep Neural Network-based Empirical Mode Decomposition for Motor Imagery EEG Classification." *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. (**SCIE, Co-first author: IF = 4.8, JCR Top 2.9%**)
- J. Yang, J. Kim, H. Ryu, **J. Lee**, C. Park*. 2024. "Predicting Car Rental Prices: A Comparative Analysis of Machine Learning Models" *Electronics* 13, no. 12: 2345 . (SCIE, Co-author: IF = 2.9, JCR Top 49.6%)
- C. Lee†, Y. Park†, S. Yoon†, **J Lee**†, Y. Cho, C. Park* (under-review). "Brain-Inspired Learning Rules for Spiking Neural Network-based Control: A Tutorial." (**Co-first author**)

Experience

Teaching Assistant Mar 2024 – Present
Kwangwoon University *On-site – Seoul, Republic of Korea*

- Computer Architecture Lab. (Spring 2024)

Undergraduate Research Assistant Jan 2022 – Present
BCML (Bio Computing and Machine Learning) Lab., Kwangwoon University *On-site – Seoul, Republic of Korea*
Advisor: Prof. Cheolsoo Park

- Neuromorphic hardware-friendly reward-modulated STDP
- Robot arm control using electromyogram
- Restoration and interpolation method for Electrocardiogram using denoising diffusion probabilistic model
- Motor imagery classification via multivariate empirical mode decomposition
- Classification of arrhythmias via 1D-2D transformation
- Detection of abnormal walking based on sensor data

Research Intern Jul 2022 – Aug 2022
Qualcomm Institute, University of California, San Diego *On-site – San Diego, California, United States*
Advisor: Prof. Justin Seokheon Cho

- Analysis of disease classification model using Local Interpretable Model-agnostic Explanation method
- Classification of breast tumors using Support Vector Machine

Fire Direction Specialist, Squad Leader, Sergeant Jun 2020 – Dec 2021
Capital Defense Command, Republic of Korea Army *On-site – Seoul, Republic of Korea*

- Mathematical computations to determine artillery firing angles
- Training new recruits in these mathematical calculations
- Squad management tasks

Projects

Teaching Assistant Mar 2024 – Present
Kwangwoon University *On-site – Seoul, Republic of Korea*

- Computer Architecture Lab. (Spring 2024)

Honors And Awards

- Excellence Award, "SNN-based arm motion imitation robot arm control algorithm using EMG and DVS", The World Embedded Software Contest 2023, Korea Electronics Technology Institute, 2023
- Software Competence Excellence Scholarship, Kwangwoon University, {2019, 2022, 2023}
- **Best Paper Award (Bronze)**, 2022 IEEE ICCE-Asia 2022, IEEE, 2022
- Excellence Award, “Real-Time Matchmaking System Development using Machine Learning algorithm and TrueSkill™ algorithm”, Ministry of National Defense Start-Up Challange, Republic of Korea Ministry of National Defense, 2021
- Academic Excellence Scholarship, Kwangwoon University, 2019
- Grand Prize, “Text-To-Speech based on Generative Adversarial Network”, 2019 Chambit Design Semester Performance Presentation, Kwangwoon University, 2019
- Microsoft Azure Prize, "Mixed Reality Game", The 1st Welcome to the maker world, Microsoft Korea, 2017

Certifications

- Introduction to Statistical Methods with MATLAB, MATLAB, Feb 2023
- Qualcomm Institute Artificial Intelligence (AI) Development Project, Qualcomm Institute, Aug 2022
- AI Framework Certificate(KNIME Certification: L1 Examination, KNIME, Aug 2022
- Principles of Supercomputer and Supercomputing, Korea Institute of Science and Technology Information, Nov 2016

Communications

- J. Yang, J. Kim, **J. Lee**, H. Ryu, S. Yeo, P. Kim, Y. Kim, J. Lim, H. Yoon, C. Park, “Metaverse: Research Based Prediction Model of the Car Price in view of the Machine-learning Method", In *2023 IEEE International Conference on Metaverse Computing* (IEEE MetaCom 2023), Jun 2023, Kyoto, Japan
- Y. Kang, **J. Lee**, C. Park*, “Probabilistic Modeling for Multivariate Signal Restoration in PPG and ECG Using Denoising Diffusion", In *The Korean Society of Medical & Biological Engineering Spring Conference 2023*, May 2023, Daegu, South Korea
- **J. Lee**, C. Park, “Denoising Diffusion Probabilistic Model based Time-Series ECG data Interpolation”, In *2022 Korean Society of Medical & Biological Engineering Autumn Conference*, Nov 2022, Incheon, South Korea
- **J. Lee**, C. Park, “Restoration of Time-Series Medical Data with Diffusion Model”, In *2022 IEEE International Conference on Consumer Electronics-Asia* (ICCE-Asia), Oct 2022, Yeosu, South Korea
- S. Baek, H. Yu, **J. Lee**, C. Park, “Design of Explainable AI Model with LIME for Single Channel Electroencephalogram”, In *2022 Summer Annual Conference of IEIE*, Jun 2022, Jeju, South Korea
- S. Baek, S. Han, **J. Lee**, C. Park, “Arrhythmia Classification Using 1D-2D Conversion”, In *u-Healthcare 2019*, Dec 2019, Seoul, South Korea

Organizations

Organizer, Google Developer Student Clubs Kwangwoon University Sep 2023 – Present

Student member, IEEE, Seoul Section Sep 2022 – Feb 2024

Member, IEEE Consumer Technology Society Sep 2022 – Feb 2024