Jiwoon Lee

LinkedIn | GitHub | ResearchGate

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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*

- Neuromorphic Hardware-Friendly Reward-modulated STDP
- 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

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

- Robot Arm Control using Electromyogram
- Signal to Spike Encoding Inspired by Neural Signaling
- 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 using Random Forest

Research Intern Jul 2022 – Aug 2022
Qualcomm Institute, University of California, San Diego *On-site – San Diego, California, United States*
Advisor: Prof. 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-side – Seoul, Republic of Korea*

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

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**, 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”, Chambit Design Semester Performance Presentation, Kwangwoon University, 2019
- Microsoft Azure Prize, "Mixed Reality Game", The 1st Welcome to the maker world, Microsoft Korea, 2017

PUBLICATIONS

- C. Lee†, Y. Park†, S. Yoon†, J Lee†, Y. Cho, C. Park* (2024). "Brain-Inspired Learning Rules for Spiking Neural Network-based Control: A Tutorial.", Under review. (†Co-first author. * Corresponding author.)
- H. Yu†, S. Baek†, J. Lee†, I. Sohn, B. Hwang*, C. Park* (2024). "Deep Neural Network-based Empirical Mode Decomposition for Motor Imagery EEG Classification.", Under review. (†Co-first author.)
- J. Yang, H. Ryu, J. Lee, C. Park* (2024), "Design of Metaverse Rental Car Price Prediction Method Through Machine Learning Techniques.", *Journal of Broadcast Engineering 29, no. 1*

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 *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, Republic of Korea
- J. Lee, C. Park, “Denoising Diffusion Probabilistic Model based Time-Series ECG data Interpolation”, In *The Korean Society of Medical & Biological Engineering Autumn Conference 2022*, Nov 2022, Incheon, Republic of 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, Republic of Korea
- S. Baek, H. Yu, J. Lee, C. Park, “Design of Explainable AI Model with LIME for Single Channel Electroencephalogram”, Summer Annual Conference of IEIE 2022, Jun 2022, Jeju, Korea
- S. Baek, S. Han, J. Lee, C. Park, “Arrhythmia Classification Using 1D-2D Conversion”, In *u-Healthcare 2019*, Dec 2019, Seoul, Republic of Korea

PATENTS

- KOR 10-2022-0189990, J. Lee, G. Yang, and C. Park, “Restoration method for corrupted Time-series medical data based on Probabilistic model”, Dec 2022
- KOR 10-2016-0045279, J. Lee, “AR navigation service using the Indoor Positioning System and Beacon”, Apr 2016

ORGANIZATIONS

Organizer, Google Developer Student Clubs Kwangwoon University	Sep 2023 – Present
Student member, IEEE, Seoul Section	Sep 2022 – Present
Member, IEEE Consumer Technology Society	Sep 2022 – Present