

Sungjae Lee

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RESEARCH INTERESTS

- Reasoning and Planning with Large Language Models
- Reinforcement Learning Algorithms

EDUCATION

Pohang University of Science and Technology

Doctor of Philosophy, Computer Science and Engineering

- Advisor : Jungseul Ok

Pohang, South Korea

September 2023 - present

Dongguk University

Master of Science, Industrial and Systems Engineering

- Advisor : Youngdoo Son
- Thesis : Multitask Learning via Gradient-based Meta Learning

Seoul, South Korea

March 2019 - February 2021

Dongguk University

Bachelor of Engineering, Industrial and Systems Engineering

Seoul, South Korea

March 2012 - August 2018

INDUSTRY EXPERIENCE

VUNO

Machine Learning Researcher, Biosignal u-healthcare team

Seoul, South Korea

January 2021 – August 2023

- Developing deep learning-based detection and prediction algorithm of heart disease using electrocardiogram.
- Conducting clinical research for cardiac patients, specialized on arrhythmia and heart failure.
- Building a product pipeline including data pre-processing, noise detection, model development, and deployment.

PUBLICATIONS

International Conference (*equal contribution)

- **Sungjae Lee**, Hoyoung Kim, Jeongyeon Hwang, Eunhyeok Park, Jungseul Ok, “Efficient Latent Semantic Clustering for Scaling Test-Time Computation of LLMs”, EMNLP Findings 2025.
- Hyosoon Jang, Yunhui Jang, **Sungjae Lee**, Jungseul Ok, Sungsoo Ahn, “Self-Training Large Language Models with Confident Reasoning”, EMNLP 2025 Findings.
- **Sungjae Lee***, Hyejin Park*, Jaechang Kim, Jungseul Ok, “Semantic Exploration with Adaptive Gating for Efficient Problem Solving with Language Models”, ACL 2025 (Oral, < 8% of accepted).

International Journal (*equal contribution)

- Jungmin Choi*, **Sungjae Lee***, Mineok Chang, Yeha Lee, Gyu Chul Oh, Hae-Young Lee (2022), “Deep Learning of ECG Waveforms for Diagnosis of Heart Failure With a Reduced Left Ventricular Ejection Fraction”, *Scientific Reports* 12, 14235.
- **Sungjae Lee**, Youngdoo Son (2022), “Multitask Learning with Single Gradient Step Update for Task Balancing”, *Neurocomputing* 467, 442-453.
- Jaihyuk Choi, **Sungjae Lee**, Youngdoo Son, Soo Youn Kim (2020), “Design of an Always-On Image Sensor Using an Analog Lightweight Convolutional Neural Network”, *Sensors* 20(11), 3101.
- **Sungjae Lee**, Yung-Seop Lee, Youngdoo Son (2020), “Forecasting Daily Temperatures with Different Time Interval Data Using Deep Neural Networks”, *Applied Sciences* 10(5), 1609.

Domestic

- Sunghoon Joo, Mineok Chang, Kyunggeun Kim, **Sungjae Lee**, Yeongyeon Na, “METHOD AND APPARATUS FOR ANALYZING ELECTROCARDIOGRAM DATA”, Patent No. 1027887150000, *Granted*, 2025.
- Youngjae Song, **Sungjae Lee**, “METHOD FOR EXTRACTING HEART RATE VARIABILITY FEATURE VALUE”, Patent No. 1026532590000, *Granted*, 2024.
- Mineok Chang, Sunghoon Joo, **Sungjae Lee**, Kyunggeun Kim, Yeongyeon Na, “DISEASE DIAGNOSIS METHOD”, Patent No. 1026470170000, *Granted*, 2024.
- Youngdoo Son, **Sungjae Lee**, Yung-Seop Lee, “METHOD AND DEVICE FOR FORECASTING METEOROLOGICAL ELEMENT BASED ON CONVOLUTIONAL NEURAL NETWORKS USING HIGH FREQUENCY METEOROLOGICAL DATA”, Patent No. 1025700990000, *Granted*, 2023.

Last updated at 2025.08.28