Joon Hyuk Lee



Undergraduate Student & Research Intern
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Education

Mar. 2020 ~ Present	**Kyung Hee University** Software Convergence (BS') *Advised by Professor Won-hee Lee* - GPA: 3.8/ 4.3	Seoul, Korea
Mar. 2020 ~ Present	**Kyung Hee University** Physical Education (BS') - GPA: 3.8 / 4.3	Seoul, Ko

Research Interest

My research interests focus on **medical AI**, with an emphasis on improving **model performance**, **representation quality**, and robustness across architectures used in medical imaging and anomaly detection. I investigate diverse paradigms—including Autoencoders for reconstruction-based **anomaly detection**, transformer models for high-dimensional imaging such as Brain. Also, the contrastive or self-supervised learning frameworks for **label-efficient feature learning**—while exploring **LLM-driven clinical workflows** using diverse frameworks such as PyTorch, LangGraph, Python.

I am currently studying how these models behave under limited labels, distribution shifts, and subtle pathological or radiological variations, with the goal of **developing scalable and reliable algorithms** for complex volume of clinical data.

Keyword

- Biomedical Anomaly Detection & Medical Image Analysis (ex. CT, MRI) [R01]
- Multimodal Medical Time-Series Analysis (ex. EEG, fMRI) [R02] [P03]
- Computational Medical Imaging & Representation Learning [R01]
- Agentic AI Systems (LLM-Driven Workflows) [R03] [P02]

Research Experience

- Undergraduate Research Student at AIMS Lab (Laboratory of Artificial Intelligence in Medicine and (Neuro)Science)

  - Yong-in. Korea / Research Intern. (Aug. 2025 ~ Present)

  1. [**R01**] Research on Unsupervised, Self-Supervised Learning & Anomaly Detection in Brain CT Image

  2. [**R02**] Research on Multi-modal Data Engineering for Wearable Devices and Emotion recognition with Machine Learning process

- AI Research & Engineering Intern at FutureWorkLab.co

  - Seoul, Korea / AI Research & Engineering Intern (Dec. 2024 ~ Sep. 2025)

  3. [**R03**] Research on Graph Neural Networks & AI Agent development with LangGraph

Project

- [**P03**] 학습자의 정서적 요인이 학습에 미치는 영향 [2025-1융복합 국제공동연구], 경희대학교 산학협력단, Korea / Research & Engineering in Multi-modal data (Sep. 2025 ~ Present)
  - Conducting research on **multimodal learner-state modeling** using emotion, immersion, and various behavioral signals.

- [**P02**] LinkBrain, FutureWork Lab, Korea / Research, Engineering in Neural Networks & AI Agent development (Dec. 2024 ~ Sep. 2025)
  - Developed GNN-based knowledge graph systems and **AI-driven agent workflows**
  - Enabling structured reasoning and automated information retrieval across complex domain data.

- [**P01**] FinWise, Korea University INISW, Korea / Development Team Leader (Sep. 2024 ~ Dec.)
  - Led the development of a Linear Hyper-GNN system that collects & connects the edge between the keywords in economic news.
  - Integrating an **agentic workflow** to deliver insights through a Chrome extension.

Publications (Domestic)

1. Development of a Machine Learning–Based Attention Prediction Model Using Multimodal Physiological Signals", 한국정보과학회 - KSC (Korea Software Congress), (2025)

Awards & Honors

- Grand Prize Award, KHUTHON, 경희대학교 SW중심대학사업단, 중앙IT 동아리 쿠러그 / 경기대학교 SW 중심대학사업단 / 단국대학교 SW중심대학 / 아주대학교 SW중심대학사업 , Korea (May. 2024)
- Excellence Award, Korea Univ 5th INISW Academy, 고려대학교 / 과학기술정보통신부 / 정보통신기획평가원, Korea (Dec. 2024)