

Jiho Shin

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Personal Profile

Self-driven and fast learning biomedical engineering student with extensive research experience communicating with clinicians, passionate about developing trustworthy AI systems for healthcare. Through project integrating multimodal medical data for sepsis prognosis and dermatological diagnosis, I have built strong analytical and research skills centered around AI in healthcare. I aspire to become an independent researcher advancing interpretable medical AI that bridges clinical insight and computational innovation, ultimately improving patient care and healthcare equity.

Education

Imperial College London - Biomedical engineering (Meng)

2022 - Present

CGPA: 4.00 (First Class)

- Grade: First Class Expected
Year 1: 70.22%; Year 2: 73.82%; Year 3: 76.82%
- Relevant modules:
Image Processing, Mathematics, Programming, Medical science, Probability, Statistics and Data Analysis, Control engineering, Neuroscience for Machine learners, Reinforcement Learning for Bioengineers

North London Collegiate School Jeju, South Korea – International Baccalaureate (IB)

2016-2020

CGPA: 4.00 (44/45)

- Mathematics HL(7); Physics HL (7); Geography HL (7); English SL (7); Korean SL (7); Chemistry SL (7)

Research experience

ICU Research Group, Charing Cross Hospital: AI-assisted Multi-modal Sepsis Mortality Prediction Model

Undergraduate Researcher supervised by Dr. Komorowski

June 2024 – Aug 2024

- Applied **dimensionality reduction techniques (PCA, t-SNE)** to integrate chest X-ray embeddings with clinical features for mortality prediction.
- Optimized **multiple machine learning models (Logistic Regression, XGBoost, LightGBM)** using GridSearchCV, achieving highest performance with LightGBM (AUROC = 0.79).
- **Communicated** with clinicians to identify clinical needs and align them with technical objectives, while collaborating with technical experts to select appropriate analytical and modeling approaches.
- **Extended** the project as my master's thesis, developing a **multimodal patient clustering framework**.

Tanaka Lab, Imperial College London: AI-assisted Eczema Herpeticum Diagnosis from Medical images

Undergraduate Researcher supervised by Professor Tanaka

Aug 2024 – Oct 2024

- Designed and compared **CNN-based and feature-extraction models** for EH diagnosis, achieving highest accuracy of 95% with hybrid VGG16 + hand-crafted features (GLCM, LBP, color histogram, edge detection).
- Applied **Grad-CAM** and feature importance visualization for **model interpretability** and clinical trust.
- **Continued** the work as my undergraduate research project focused on improving model performance and optimization.

Applied Superconductivity Lab, Seoul National University: Cost-Efficient Low-Field MRI magnet structures

Undergraduate Researcher supervised by Professor Hahn

Jul 2024 – Sep 2024

- Conducted research to **provide cost-effective healthcare solutions** to resource-limited, underserved countries.
- **Independently** studied literature on superconductivity, electromagnet design, and magnetic field modelling, designing coil geometries and analyzing performance trade-offs under cost constraints.

- Developed **critical problem-solving and self-directed learning skills** through exploring interdisciplinary links between biomedical engineering and applied electromagnetics.

Research projects

Undergraduate Research Project: Advanced Optimization of Eczema Herpeticum Diagnosis Model

Project Technical Head supervised by Professor Tanaka

Oct 2024 – June 2025

- **Led a team with no prior AI experience**, conducting weekly meetings to mentor members and coordinate tasks, strengthening leadership, project management, and teaching skills.
- Applied **GAN-based** data augmentation and Bayesian hyperparameter optimization (**Optuna**) for improved generalisation on imbalanced datasets.
- Compared **multiple cutting-edge transfer learning architectures (InceptionV3, VGG16, ResNet50)**, achieving 98.1% accuracy on external test dataset.
- Contributed optimized modules into the **EczemaNet clinical pipeline** (Tanaka group).

Master's Thesis: Fusion of Clinical and Radiological Data using Unsupervised Learning for Patient State Representation

Undergraduate master's student supervised by Professor Yang and Dr. Dominic Marshall

Oct 2025 – Present

- Developing **multimodal fusion frameworks** that integrate chest X-ray embeddings (MedImageInsight, CXR-Foundation) with structured clinical data to generate interpretable patient representations.
- Designed benchmarking pipelines comparing **foundation models** across MIMIC-CXR and NIH-CXR14 datasets, achieving **>0.90 mean AUROC** across thoracic disease labels.
- Applied **unsupervised clustering (UMAP, k-means, hierarchical)** to identify disease-specific latent structures and evaluate model robustness across datasets.

Teaching Experience

Undergraduate Teaching Assistant (UTA) – Imperial College London

Jan 2025 – Feb 2025

- Mentoring first-year undergraduates in the theoretical principles of op-amp-based electronic circuits and their simulation using Altium SPICE.

Posters and Conferences

- Presented my work on “Conceptual design of extremity MRI magnet using commercial MgB2 conductor” at **Korean Society of Super-conductivity and Cryogenics (KSSC) conference**.
Sep 2023
- Presented at the **2nd Johns Hopkins University-Korea Biotechnology Innovation Symposium** on my current research on multimodal patient state representation for ICU sepsis patients. *Oct 2025*
Demonstrated key attributes including research independence, interdisciplinary collaboration, and effective scientific communication.

Certificates

Machine Learning Specialization, Deep Learning AI - online course by coursera

Nov 2023

- Course includes Supervised machine learning (Regression and Classification) and Unsupervised machine learning (Recommenders, Reinforcement learning)

Investment Banking Program (J.P. Morgan) – Virtual Internship

Oct 2023

- Acquired financial analysis skills including DCF valuation, and core skills to analyse potential M&A targets

Skills & Interests

Technical: Python, PyTorch, scikit-learn, LightGBM, XGBoost, Optuna, MATLAB, OpenCV, Git, Linux, HPC (Imperial RDS)

Machine Learning: CNNs, transfer learning (VGG16, InceptionV3), multimodal fusion, dimensionality reduction (PCA, t-SNE, UMAP), clustering (k-means, hierarchical)

Optimization & Analysis: Hyperparameter tuning, model interpretability (Grad-CAM, feature importance), reproducible benchmarking

Language: English(proficient); Korean(native); Japanese (intermediate)

Interests: Snowboarding (Youth national team for half pipe until 2016, currently member of Imperial Snow sports society), Diving (acquired open-water diving license in Japan, AI in healthcare)