Changmin Lee

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Education

Sangmyung University Seoul, S.Korea
B.S. in Department of Human-Centered Artificial Intelligence Mar. 2020 – Feb 2026 (expected)

- Completed 7th semester; 8th semester scheduled Sep. 2025
- Cumulative GPA: **4.30 / 4.50** | Major GPA: **4.42/ 4.50**

Selected Relevant Coursework

Neuroscience & Bio-engineering
- Neural Engineering, Biometrics, Physical Computing, Coding & Math for Bio-Health

Machine Learning & Artificial Intelligence
- Deep Learning, Introduction to Artificial Intelligence, Image Pattern Recognition

Signal & Image Processing
- Digital Signal Processing, Digital Image Processing

Data Engineering & Networking
- Database, Big Data Analysis, Network Programming

Mathematics & Statistics
- Linear Algebra, Statistics, Discrete Mathematics

Core Computer Systems & Architecture
- Data Structures, Algorithm, Computer Architecture, Operating System

Research Experience

Emotion Contents Technology Research Center Seoul, S.Korea
Research Intern Jan. 2025 - Present
Advisor: Prof. Mincheol Whang

- **Led an end-to-end research project on brain-inspired AI, resulting in a first-author publication.**
  - Independently established the entire research infrastructure from scratch, including lab server hardware setup, Linux OS installation, and configuration of deep learning environments.
  - Managed the full data pipeline for the MAHNOB-HCI biosignal dataset, from acquisition and validation to preprocessing for time-series analysis.
  - Designed and implemented a novel framework to decode human emotions from rPPG signals, which integrates a neuro-physiologically inspired temporal encoder with a cognitively-inspired attention curriculum.
- **Contributing to an ETRI (Electronics and Telecommunications Research Institute)-funded project** to model Emotional Intelligence (EI).
  - Developing and validating multimodal deep learning architectures that integrate physiological data (ECG) with behavioral cues (facial micro-expressions) to decode individual EI levels.
  - A manuscript detailing this project is in preparation for publication.

Publication

1. Lee, C., Lee, H., & Whang, M. (2025). Emotion Recognition from rPPG via Physiologically Inspired Temporal Encoding and Attention-Based Curriculum Learning. *Sensors*, *25*(13), 3995. https://doi.org/10.3390/s25133995

Selected Projects

Capstone Project: Text2VR - Asset-Centric 3D Scene Generation for Immersive VR. Sangmyung Univ.
Team Leader Jan. 2025 – Present

- Developing a pipeline that generates interactive VR environments from text prompts.
- Utilizing DreamScene360 for 3D Gaussian Splatting scene generation and Hunyuan3D-2.0 for segmenting and creating interactable 3D assets (.glb).
- Implementing a system to automatically identify, convert, and place interactive objects within a unified Unity scene, preserving spatial coordinates.

CODEEG: EEG-Based Fashion Recommendation and Virtual Try-On System Sangmyung Univ.
Team Leader Oct. 2024 – Dec. 2024

- Engineered a Brain-Computer Interface (BCI) system that analyzes EEG-based Event-Related Potentials (ERP), specifically the P300 signal, to decode user clothing preferences.
- Integrated the BCI with a state-of-the-art diffusion model (IDM-VTON) to generate personalized virtual try-on images, creating a seamless neuro-recommendation web service.

Real-time ECG Monitoring and Control System Sangmyung Univ.
Solo Project Nov. 2024 – Dec. 2024

- Developed an embedded system on an STM32F4xx board for real-time ECG signal acquisition and analysis.
- Implemented real-time processing of 100Hz ADC ECG data to display heart rate on an FND and control actuators (RGB-LED, servo motor) based on heart rate variability.
- Utilized hardware interrupts for user interaction, such as adjusting LED brightness.

DACON Medical AI (MAI) Competition DACON, S.Korea, Seoul
Team Member Oct. 2024 – Nov. 2024

- Developed a high-performing ensemble model to predict gene expression profiles from pathology images, achieving a top 8% rank (22nd/266).
- Implemented SOTA architectures (ViT, Swin Transformer, etc.) with 5-fold cross-validation, advanced augmentation (CutMix, FMix), and a weighted-average ensemble with TTA.

The 1st KASI and KAIST AI Competition KASI, KAIST, Elice, S.Korea
Team Leader Jul. 2024 – Aug. 2024

- Built a custom AI model from scratch to classify solar features and perform object detection on solar images.
- Achieved robust performance in detecting specific solar phenomena and identifying their precise locations.
- First Prize

2023 BioHealth Data Contest - Dental Field Hongik Univ. S.Korea
Team Member Nov. 2023 – 1st Dec 2023

- Hosted by Bio-Health Innovation & Convergence Univ. Group in collaboration with Samsung Medical Center & KyungHee Univ. Dental Hospital
- Fine-tuned a DenseNet-121 model to classify the extraction risk of wisdom teeth from dental images, demonstrating strong capabilities in medical image analysis and transfer learning.

Additional Projects

- **G'dayMate** | Sangmyung Univ.: Designed an AI service for objective peer evaluation using quantitative metrics from team interactions. (Dec. 2024)
- **AI Bootcamp Project - Diffusion-based Virtual Try-on** | OUTTA & Seoul National University, S.Korea: Implemented a virtual try-on pipeline using prompt engineering, image segmentation, and diffusion models to synthesize clothing onto model photograph. (Jul. 2024 – Aug. 2024)
- **SW-Centered University Digital Competition (45th / 219)** | DACON, S.Korea: Developed a fake voice detection model using the AASIST architecture. (Jun. 2024 - Jul. 2024)
- **AI+X Pioneers Training Project with KT** | Sangmyung Univ., KT: Performed EDA and built ML/DL models for subway passenger behavior analysis (classification) and fine dust prediction (regression). (Mar. 2024 – Jun. 2024)
- **AI & Cloud Service Contest (Excellence Award)** | SW-centered University Business Group, S.Korea: Designed an MM-RAG system architecture for generating avatars from missing person data. (Mar. 2024 – Apr. 2024)
- **HAPPB** | AWS & Inha Univ. Hackathon, S.Korea: Contributed to front-end development of a clothing recycling app using Android (Java) and AWS. (Jul 2023)

Extracurricular Activity

BAMBOO Academic Club Sangmyung Univ.
President Jan. 2024 – Jan. 2025
- Led a 100-member Human-Centered AI department's academic club covering Big Data, AI, Machine Learning, Basic Programming, Optimization, and Overall Algorithms.
- Organized seminars, research projects and collaborative learning activities.

Senior Member & Mentor Mar. 2022 – Present
- Completed weekly study series on Python, data analysis, and machine/deep learning; currently lead an ongoing paper-review study group.
- Mentored first-year members in Python and data-analysis study tracks, guiding them through introductory projects and coding best practices.

Student Council Sangmyung Univ.
General Affairs Coordinator Feb. 2024 – Dec. 2024
- Organized a one-year budget for the department by analyzing budget data from 2018 to 2023.

Honors and Awards

Honors
- **National Scholarship for Science and Engineering Scholarship** — KOSAF, **full tuition**, Spring 2024 – Fall 2025 (4 semesters)
- **SW Scholarship (Beyond the Scholarship Limit)** — SMU SW-centered Univ., **quarter tuition**, Spring & Fall 2024 (2 awards)
- **SW Scholarship (Top in Department)** — Sangmyung Univ., **full tuition**, Fall 2020

Awards
- **1st Prize**, *KASI·KAIST AI Space Science Competition* (KASI & KAIST), Sep. 2024
- **Excellence Award (2nd)**, *AI & Cloud Service Case Contest* (SW-centered Univ. Business Group), Jun. 2024
- **Encouragement Award (4th)**, *BioHealth Dental Data Contest* (BioHealth Univ. Alliance**),** Dec. 2023
- **Army Commendation Medal (ARCOM)**, U.S. Army, KATUSA Service**,** Aug. 2022
- **Army Achievement Medal (AAM)**, U.S. Army, KATUSA Service, Jul. 2022

Certifications and Qualifications

- K-CAMT Hackathon for Net-Zero Carbon & Energy — Chiang Mai University, Thailand (20 – 25 Dec 2024), 42 h academic + hackathon program
- OUTTA AI Bootcamp – Deep Learning (Advanced) — OUTTA, supported by SNU GEC·CEEI & ChannelTalk (1 Jul – 31 Aug 2024), 8-week intensive (~80 h)
- AI Convergence Capability Certification, Class 2 — 7th SMU AI Convergence Competence Exam (Host: Sangmyung University; Admin: Korea Productivity Center), Nov 2024
- TOEIC 845 — ETS, Test date 24 Nov 2024

Skills

- **Programming** Python, C/C++, Java, MATLAB
- **ML & Data** PyTorch, TensorFlow, scikit-learn, NumPy, SciPy, Pandas, OpenCV
- **Visualization & Experiment** Matplotlib, Seaborn, Weights & Biases, Jupyter Notebook
- **Cloud & DevOps** Google Cloud Platform, Docker, Git, Bash/SSH
- **Databases** MySQL, MongoDB
- **Hardware Prototyping** Arduino, STM32
- **Documentation** LaTeX, Markdown