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, Reinforcement Learning

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

MAILAB (Medical Artificial Intelligence Lab), Korea University Seoul, S.Korea
Research Intern (Advisor: Prof. Tae-Eui Kam) Jan. 2025 - Present

- **Visual Brain Decoding Project (BCI)**: Leading a research project to reconstruct visual stimuli from EEG signals.
- Proposed a **brain-inspired dual-stream framework** separating EEG signals into ventral ('what') and dorsal ('where') pathways to mimic human visual processing.
- Designed a hierarchical alignment mechanism mapping EEG features to specific layers of the **CLIP visual model** (semantic vs. spatial).
- Achieved **~25% Top-1 retrieval accuracy** on the THINGS-EEG2 dataset, outperforming monolithic baselines by 3%.
- **Outcome:** Published a poster at **KOSOMBE 2025** and preparing a manuscript for **IEEE BCI Winter 2026**.

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

- **Affective Computing Project:** Conducted research on emotion recognition using physiological signals (rPPG, ECG).
- Designed and implemented a deep learning framework integrating **physiologically inspired temporal encoding** with an attention-based curriculum learning strategy.
- Managed the full data pipeline for the MAHNOB-HCI biosignal dataset, from validation to preprocessing.
- **Outcome:** Published a first-author paper in **Sensors** (SCIE, IF 3.4).

Publication

1. **C. Lee**, JM. Kim, WH. Choi, Y. Choi, TE. Kam. "Brain-Inspired Dual-Stream Fusion for EEG-to-Image Retrieval." *Proceedings of the 2025 KOSOMBE Fall Conference*, p. 374, Poster-025. (Poster Presentation)
2. **CM. Lee**, JM. Kim, WH. Choi, Y. Choi, TE. Kam. "Brain-Inspired Dual-Stream Fusion Network for Decoding Human Visual Intentions." *Targeting IEEE International Winter Conference on Brain-Computer Interface (IEEE BCI) 2026*. (In Preparation)
3. **CM. Lee**, S. Myoung, M. An, Y. Jin, E. C. Lee. "Text2VR: An End-to-End Pipeline for Interactive VR Scenes from a Single Text Prompt." *Submitted to HCI Korea 2026*. (Under Review)
4. **CM. Lee**, S. Myoung, M. An, Y. Jin, E. C. Lee. "Text2VR: A Modular Pipeline for Interactive VR Scenes from a Single Text Prompt." (Under Review)
5. **C. Lee**, H. Lee, M. Whang. (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

NeurIPS 2025 EEG Foundation Challenge. Korea Univ.
Team Member Sep. 2025 – Nov. 2025

- Participated in the "Cross-Task to Cross-Subject EEG Decoding" challenge utilizing the HBN-EEG dataset (3,000+ subjects).
- Developed models for **Cross-Task Transfer Learning** (predicting response time from passive tasks) and **Externalizing Factor Prediction** (subject-invariant trait decoding).
- Achieved a final overall score of **0.98008** on Codabench and Ranked 18th / 1,183 Teams (**Top 1.5%**).

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

- Developed a one-shot pipeline that synthesizes interactive VR scenes from a single text prompt.
- Integrated **StitchDiffusion** for panoramic background generation with **GPT-4o based self-refinement**, and converted it into a **3D Gaussian Splatting (3DGS)** representation.
- Implemented scene decomposition using **Grounded-SAM** and reconstructed interactive 3D assets using **Trellis** (single-view reconstruction).
- Automated the coordinate alignment of assets within the 3DGS background using depth priors for immediate playback in **Unity**.

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.

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

Additional Projects

- **G'dayMate** | Sangmyung Univ.: Designed an AI service for objective peer evaluation using quantitative metrics from team interactions. (Dec. 2024)

- **DACON Medical AI (MAI) Competition (Top 8%, 22nd/266)** | DACON: Developed a high-performing ensemble model (ViT, Swin) to predict gene expression profiles from pathology images. (Oct. 2024 – Nov. 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)
- **BioHealth Data Contest - Dental Field (Encouragement Award)** | Hongik Univ.: Fine-tuned DenseNet-121 to classify wisdom tooth extraction risk, demonstrating transfer learning skills. (Nov. 2023 – Dec. 2023)
- **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
- **Excellence Award (Graduation Project)**, Sangmyung University, Nov. 2025
- **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