HYO-JEONG LEE

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Summary

Undergraduate in computer science with interdisciplinary research experience in cognitive neuroscience. Focused on understanding **neuronal network dynamics** using **theoretical neuroscience** and **cognitive modeling**.

Education

Gwangju Institute of Science and Technology (GIST) *Mar 2022 – Present*
B.S. in Electrical Engineering and Computer Science
Minor in Biomedical Science and Engineering

- **GPA:** 3.88/4.0
- **Key Courses:** Linear Algebra, Discrete Mathematics, Bio Statistics and Machine Learning, Introduction to Artificial Intelligence, Computational Models of Cognition

University of California, Berkeley *Jan 2025 – May 2025*
Berkeley Global Access Program

Korea Advanced Institute of Science and Technology (KAIST) *Aug 2024 – Dec 2024*
Visiting Student

University of California, Berkeley *June 2023 – Aug 2023*
Summer Session Program

Research Experience

Neurophotonics Lab, GIST *Gwangju, South Korea*
Undergraduate Researcher (Advisor: Prof. Euiheon Chung) *Sep 2025 – Present*

- Led a project on spectral graph theoretical analyses on primary cortical neuron cultures using high-density multielectrode arrays (HD-MEAs) with amyloid-beta oligomers.
- Led a project investigating the impact of trial-to-trial shared neural variability and its alignment with the readout axis on the cognitive decline in older adults.

The Computation and Language Lab, UC Berkeley *Berkeley, United States*
Undergraduate Researcher (Advisor: Prof. Steven Piantadosi) *May 2025 – Present*

- Led a project decoding causal states from feature vectors in task-trained recurrent neural networks (RNNs) for cognitive modeling.
- Investigated how causal states can function as general cognitive states, and analyzed their embedding properties in functional magnetic resonance imaging (fMRI) and RNNs.

Brain Machine Intelligence Lab, KAIST *Daejeon, South Korea*
Undergraduate Researcher (Advisor: Prof. Sang Wan Lee) *Sep 2024 – Dec 2024*

- Participated in a project decoding electroencephalogram (EEG) signals of prediction errors in model-based and model-free decision-making.
- Assisted graduate students with literature review, code evaluation, and research discussions.

BioComputing Lab, GIST *Gwangju, South Korea*
Undergraduate Researcher (Advisor: Prof. Sung Chan Jun) *June 2024 – Aug 2024*

- Led a project exploring behavioral and EEG responses in Deepfake face discrimination under label alteration.
- Designed and conducted an EEG recording behavioral experiment and analyzed event-related potentials.

Neurophotonics Lab, GIST *Gwangju, South Korea*
Undergraduate Researcher (Advisor: Prof. Euiheon Chung) *Dec 2022 – Feb 2024*

- Participated in a HD-MEA project, focusing on research design and the initial experiment setup.

Publications

Lee, H., & Piantadosi, S. T. (in preparation). Modeling Internal Representations of Task-Trained RNNs as Cognitive-State Automata.

Lee, H., Ashiquzzaman, A., Kwon, H. S., Kim, Y. R., Kim, S. S., & Chung, E. (in preparation). Spectral Graph Theoretical Characterization of Cortical Neuronal Networks using HD-MEA.

Conferences

Lee, H., & Chung, E. (2025, Nov 8). *Age-Related Reorganization of Shared Neural Variability and Readout Alignment During Cognitive Control* [Poster]. The 19th International Symposium for Aging, Gwangju, South Korea.

Lee, H., Ashiquzzaman, A., Kwon, H. S., Kim, Y. R., Kim, S. S., & Chung, E. (2025, Nov 6-8). *Spectral Graph Theoretical Characterization of Cortical Neuronal Networks using HD-MEA* [Poster]. The Korean Society of Medical & Biological Engineering Fall Annual Meeting, Gimhae, South Korea.

Teaching Experience

PIUM: Science Education Program *Sep 2022 – Nov 2022*
Volunteer Tutor

Extracurricular Activities

AIleoDreamy: AI Newsletter Team *Nov 2024 – Present*
Writer

Google Developer Student Clubs *Sep 2023 – Feb 2024*
School Core Team External Relations Leader

Buddy Program *Sep 2023 – Dec 2023*
Volunteer for International Freshmen

Korean I-Corps: Mock Starup Team *Jun 2022 – Feb 2023*
Product Manager & External Relations

Asian Science Camp *Jun 2022 – Jun 2022*
Representative of Korea

Skills

Experiment: Primary Neuron Culture, Vibratome, EEG, Mouse Handling, Mouse Behavior Test

Software: Brainwave5 (3Brain), EEGLAB, UCINET

Programming: Python, MATLAB, C, R, Java

Language: Korean (Native), English (Fluent; TOEFL 113/120)

Awards & Honors

National Scholarship for Science and Technology *Mar 2022 – Present*

Outstanding Poster Presentation Award *Nov 2025*
The 19th International Symposium for Aging

Study Abroad Program Scholarship *Jan 2025 – Mar 2025*

Academic Excellence Scholarship *Sep 2024 – Dec 2024*

AWS AI Award *Mar 2024 – Mar 2024*
AI4GOOD Hackathon

- Won 1st place among 200+ teams nationwide.
- Worked as team leader and a project manager, in addition to data processing.

Academic Excellence Scholarship *Mar 2022 – Dec 2023*