Jiyeon Yang

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Education

Seoul National University *Mar 2023 – Feb 2025*
M.S. in Brain and Cognitive Sciences (GPA: 4.0/4.0)

Hanyang University *Mar 2018 – Feb 2023*
B.S. in Biomedical Engineering (GPA: 3.94/4.0)
Minor in BIO-SW Engineering
Summa Cum Laude with Highest Honors

Research Experience

Seoul National University, Seoul, South Korea *Jan 2023 – Jul 2025*
Department of Brain and Cognitive Sciences
Advisor: Jeehyun Kwag, D.Phil.

Roles of Interneurons in Processing Spatial Information within the Mouse Retrosplenial Cortex

- Conducted *in vivo* one-photon calcium imaging to examine how parvalbumin- and somatostatin-expressing interneurons encode environmental geometry in the mouse retrosplenial cortex
- Applied optogenetic and chemogenetic manipulations to inhibit interneurons, revealing their roles in modulating spatial representation in excitatory neurons

Effects of Excitatory/Inhibitory Connectivity and Synaptic Plasticity on Synchronized Spike Propagation in a Feedforward Neural Network

- Developed a feedforward spiking neural network using Hodgkin-Huxley neuron models and short-term synaptic plasticity models
- Investigated how variations in excitatory/inhibitory motif structures and plasticity types affect the stability and propagation of synchronous spiking activity

Korea Institute of Science and Technology, Seoul, South Korea *Jun 2022 – Aug 2022*
Brain Science Institute
Advisor: Jeongjin Kim, Ph.D.

- Characterized behavioral patterns in SHANK3-mutant mice to identify ASD-relevant action sequences
- Applied a Drift Diffusion Model (DDM) to quantify the effects of locomotor speed on perceptual decision-making performance

Hanyang University, Seoul, South Korea *Mar 2021 – Dec 2021*
Department of Biomedical Engineering
Advisor: Jong-Min Lee, Ph.D.

Functional Connectivity Differences between ASD and ASD with Comorbid ADHD

- Processed large-scale resting-state human fMRI data from the ABIDE database to compare diagnostic subgroups
- Developed and trained a Graph Neural Network (GNN) to detect and interpret connectivity differences between ASD and ADHD in ASD populations

Presentations

Yang, J., Kwag, J. "Retrosplenial Parvalbumin Interneurons Gate the Egocentric Vector Coding of Environmental Geometry." Computational and Systems Neuroscience, Montreal, Canada. Poster (Mar. 29, 2025)

Yang, J., Kwag, J. "Egocentric vector coding of geometric vertex by parvalbumin interneurons in the retrosplenial cortex." Korean Society for Brain and Neural Sciences, Gyeongju, South Korea. Poster (Oct. 15, 2024)

Yang, J., Kwag, J. "The effect of inhibitory short-term plasticity on the propagation of spike synchrony in a feedforward network model." Society for Neuroscience, Washington D.C., USA. Poster (Nov. 12, 2023)

Honors and Awards

Brain and Cognitive Sciences Outstanding Research Talent Fellowship ($5,500), *2023*
BrainKorea21 and Seoul National University

Summa Cum Laude with Highest Honors, *Hanyang University* *2023*

Dean's List (Ranked 1st in the Department of Engineering), *Hanyang University* *2023*

Academic Excellence Scholarship (Total $12,000), *Hanyang University* *2019 – 2022*

Teaching Experience

Teaching Assistant

Course Name: Computational Neuroscience *Spring 2025, 2024*
Department of Brain and Cognitive Sciences, Seoul National University

- Assisted in delivering lectures and exercises on spiking neural networks; led modeling simulations and provided technical guidance to students

Course Name: Understanding the Brain as a Complex System *Fall 2023*
Faculty of Liberal Education, Seoul National University

- Facilitated interdisciplinary seminars by supporting students in designing themes, simulating brain-inspired models, and moderating discussions on contemporary neuroscience topics

Research Mentorship

SNU Natural Sciences Summer Internship for Undergraduate Students *2023 – 2024*

BCS Summer Research Internship for Undergraduate Students *2024*

International Student BCS Workshop *2023*

Activities and Leadership

Student Council, *Seoul National University* *2019 – 2022*

Brain and Cognitive Sciences Community member, *Seoul National University* *2021 – 2022*

Biomedical Engineering Student Ambassador, *Seoul National University* *2020 – 2021*

Student Council, *Hanyang University* *2020 – 2021*

Appropriate Technology Union for Students (ATUS) member, *Hanyang University* *2020 – 2021*

Skills and Techniques

Programming: Python and MATLAB

Experimental: *In vivo* One-photon Calcium Imaging, Optogenetics, and Chemogenetics

Computational: Pytorch, NEURON, and NetPyNE Simulator