Minjun Kang

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Research Interest

Computational and Theoretical Neuroscience

Education

BS **Korea Advanced Institute of Science and Technology (KAIST)** Daejeon, Republic of Korea
- Department of Bio and Brain Engineering Mar. 2017 - Aug. 2023
- GPA: 3.97 / 4.3, Major GPA: 4.11 / 4.3

Employment

Cognitive Intelligence Lab KAIST
Research Assistant Sep. 2023 - Current
- Advisor: Prof. Se-Bum Paik
- Department of Brain and Cognitive Sciences

Presentations

2024 Cognitive Computational Neuroscience (**CCN**) Aug. 2024

Kang M.J., Baek S.D., & Paik S.-B.. Stable receptive fields in the early layer enable robust continual learning under dynamic environments

2024 Computational and Systems Neuroscience (**COSYNE**) Feb. 2024

Kang M.J., Kim G.S., Lee H.S., & Paik S.-B.. Stable receptive fields in the early layer enable robust continual learning

2023 Korean Society for Brain and Neural Sciences (**KSBNS**) Sep. 2023

Kang M.J., Shin J.H., & Lee S.W.. Does the prefrontal cortex guide optimal foraging?

2020 Korean Society for Cognitive & Biological Psychology (**KSCBP**) Aug. 2020

Kang M.J., Shin J.H., & Lee S.A.. Temporal Dynamics of Prefrontal Cortex Subregion Activity During Working Memory Task: An fNIRS Study

2024 Society for Neuroscience (**SfN**) Oct. 2024

Kang M.J., Baek S.D., & Paik S.-B.. Stable receptive fields in the early visual pathway for flexible adaptation
* Accepted as poster presentation

2024 Korean Society for Brain and Neural Sciences (**KSBNS**) Oct. 2024

Kang M.J., Baek S. D., & Paik S.-B.. Stable receptive fields for flexible adaptation in dynamic environments
* Accepted as poster presentation

Publications

Shin J. H., ***Kang M.J.***, & Lee S. A. (2024). Wearable fNIRS-based measurement of dissociable activation dynamics of prefrontal cortex subregions during a delayed match-to-sample task. *Human Brain Mapping*. [Link] ↗

Kang M.J., Baek S. D., & Paik S-. B. (2024). Stable receptive fields in the early layer enable continual learning under dynamic environments. *2024 Conference on Cognitive Computational Neuroscience*. *(in press)* [Link] ↗

Award

Best Presentation Award at 2020 KSCBP Aug. 2020
* Poster presentation was substituted to recoreded-video due to COVID-19

Research Experiences

Cognitive Intelligence Lab

Research Assistant (paid)

KAIST
Jun. 2023 - Current
1 year

- Advisor: Prof. Se-Bum Paik
- Study of early visual pathway's functional role using deep neural network (DNN)
- Examine whether inherent receptive fields enable general object recognition
- Incorporated Gabor filters in the first layer of DNN to model biological brains
- Showed our model recognizes objects under dynamic domain shifts through shape-biased feature encoding
- 2 conference presentations

Brain and Machine Intelligence Lab

Undergraduate Research Student

KAIST
Mar. 2022 - Jun. 2023
1 year 4 months

- Advisor: Prof. Sang Wan Lee
- Study of human model-based (MB) reinforcement learning system using fMRI
- Examine whether MB system would also use temporal difference to estimate drifting rewards and generate reward prediction error (MB-RPE)
- Designed foraging tasks, conducted human behavior experiments
- Analyzed fMRI data, found significant MB-RPE signals from prefrontal cortex
- 1 conference presentation

Developmental Cognitive Neuroscience Lab

Undergraduate Research Intern (paid)

KAIST
Dec. 2019 - Aug. 2020
1 year 8 months

- Advisor: Prof. Sang Ah Lee
- Study of prefrontal cortex subregions' temporal dynamics during working memory using fNIRS
- Designed working memory task, conducted human behavior experiments
- Constructed novel MATLAB-based preprocessing toolbox for fNIRS data
- Devised new method for accessing decoding performance over time
- 1 journal paper, 1 conference presentation

Experiences

2022 Summer-Fall Undergraduate Research Participation Program   Jun. 2022 - Dec. 2022
* Supported 2,000,000 KRW

Undergraduate Student President, Department of Bio and Brain Engineering   Mar. 2019 - Dec. 2019
* Planned one-year student welfare projects and promoted department

2023, 2024 Korean Society for Computational Neuroscience Winter School   Jan. 2023, 2024

2020, 2023 KSBNS Division of High-level Cognition Workshop (Neurosplash)   Aug. 2020, 2023

Harvard-MIT MGH Summer Internship Program   Jan. 2020
* Selected as KAIST representatives (top 5), but canceled due to COVID-19

Military service   Sep. 2020 - Mar. 2022
* Korea Army, Honorable discharged

Skills

Softwares: MATLAB (Advanced), Python (Advanced), R, LaTex, Illustrator
Others: Neural network simulation, Neural data analysis (fMRI, fNIRS), Behavioral task design