YU JIN (JIN) OH

Ph.D Student @ University of Chicago
yujinoh@uchicago.edu | Website | GitHub

RESEARCH INTERESTS

My research interest lies in computational cognitive systems neuroscience. I am excited about understanding the neural mechanism and cognitive strategy behind how humans or other animals apply prior knowledge to solve a novel task.

Keywords: *Decision-making, Cognitive modeling, Large-scale electrophysiology recording, Reinforcement learning, Reward Learning, Geometry of representations, Generalization*

EDUCATION

University of Chicago *Ph.D. in Computational Neuroscience (in progress)* — **Chicago, United States**

- **GPA**: 3.95 / 4.0 — Class of 2028
- **Advisors**: Dr. David Freedman, Dr. Ramon Nogueira

University College London *MSc in Neuroscience* (*with Distinction*) — **London, United Kingdom**

- **Advisors**: Dr. Kenneth Harris, Dr. Matteo Carandini, Dr. Kevin J Miller — Class of 2021

Duke University *B.S. in Neuroscience, B.A. in International Comparative Studies* — **North Carolina, United States**

- **GPA:** 3.831 / 4.000 (*Cum Laude*) — Class of 2018
- **Summer Study Abroad Experiences:**
  Duke in Silicon Valley, San Francisco, CA — May – June 2016

Audited Courses: Machine Learning & Deep Learning (2022 Fall Quarter at Stanford University)
Computer Science Courses: Foundations of Machine Learning and AI – Part 1 (2024 Fall at UChicago), Foundations of Machine Learning and AI – Part II (2025 Winter at UChicago)
Math Courses: Multivariate calculus, Mathematical Methods for Biological Science (2023 Fall at UChicago)
Certificate: Neuromatch Academy Deep Learning (2021) (in Tensorflow)
Technical Skills: Pytorch, Pytorch Lightning, Python, Matlab, Unix, Neuropixels chronic recording
Software: Kilosort, Phy, LFADS, Cell Explorer

RESEARCH EXPERIENCE

Stanford University, Moore Lab, *Life Science Research Professional I* — **January 2022 – August 2023**
Advisor: Dr. Tirin Moore — California, United States

- Developed a feature-based learning task to train **nonhuman primates** using the Thomas In Cage Training System (ICTS).
- Designed a **multi-class logistic regression classifier** to decode a remembered spatial location using the Neuropixels data recorded from nonhuman primate prefrontal cortex.
- Implemented **LFADS** on the Stanford High Performance Cluster to obtain denoised single-trial neural population prefrontal cortex data and better understand single-trial dynamics during the spatial memory delay period.
- Analyzed Neuropixels data using **Kilosort**, **Phy, Cell Explorer** software to compare the monosynaptic connections between when the nonhuman primates view a large circle stimulus and small grating stimuli.

University College London, Cortex Lab, *Master's Student* — **January– November 2021**
Advisors: Dr. Kenneth Harris, Dr. Matteo Carandini — London, United Kingdom

- Applied qualitative diagnostics and normalized cross-validated log likelihood scores (in Python) to evaluate 10 **cognitive models**, including Q-learning variants, a matching law variant, ideal observer variants, a mixture-of-agents model, and the marginal value theorem model to find the best-fitting model that could capture the mice's behavior performing the dynamic two-armed bandit task.
- Conducted **chronic Neuropixels recording** on mice which are trained to perform a dynamic two-armed bandit task.

Sungkyunkwan University, Computational Cognitive Affective Neuroscience Lab, *Research Assistant* — **March – August 2018**
Advisor: Choong-Wan Woo — Suwon, South Korea

- Facilitated 3T fMRI scanning and Biopac data collection. Analyzed 11 different surveys on mind-wandering and depression symptoms of 98 participants and examined bodymap graphs, which participants colored red if felt activated, blue if felt depressed, using MATLAB.
- Researched preprocessing methods for brain, respiration, electrocardiography (ECG) data, and helped preprocessing them using TAPAS code.

Duke University, Department of Medicine, *Research Assistant* **January – June 2017**
Advisor: Murali Doraiswamy North Carolina, United States

- Discovered cortisol as the most significant predictor of change in ADAS-Cog 11 followed by pro-insulin. Extracted data from Alzheimer's Neuroimaging Initiative (ADNI-1) database on patients who changed from LMCI to Alzheimer's Disease (AD) along with their proteomics data over the course of their illness.
- Applied regression models to examine the relationship between log-transformed proteomic markers and ADAS-Cog 11 scores which show the patients' current cognition scores.

Duke University, **Center for Advanced Hindsight,** *Research Assistant* **August 2016 – January 2017**
Advisor: Dan Ariely North Carolina, United States

- Derived behavioral patterns of fin-tech users through data analytics to transform low-income individual's saving method, with Common Cents Lab within CAH. Surveyed low-income families in Durham and observed their spending/saving habits.

PUBLICATIONS

- M.F. Panichello*, D. Jonikaitis*, **Yu Jin Oh**, S. Zhu, E.B. Trepka, T. Moore (2024). "Intermittent Rate Coding and Cue-Specific Ensembles Support Working Memory" *Nature*
- S. Zhu, **Yu Jin Oh**, E.B. Trepka, X. Chen, T. Moore (2024). "Dependence of Contextual Modulation in Macaque V1 on Interlaminar Signal Flow" *eLife*
- A. Lebedeva, Y.Wang, L. Funnell, B. Terry, **Yu Jin Oh**, K.J.Miller, K.D.Harris (2024). "Dorsal prefrontal cortex drives perseverative behavior in mice." *bioRxive* [Under review in Neuron]

POSTER PRESENTATION

- S. Zhude, **Yu Jin Oh**, E.B. Trepka, X. Chen & T.Moore. "Border Ownership Selectivity and Laminar Connectivity in Single Columns of Macaque V1 Measured with High-Density Neuropixels Recordings." Society for Neuroscience 2023
- M.F. Panichello*, D. Jonikaitis*, **Jin Oh**, S. Zhu, E.B. Trepka, T.Moore. "Intermittent Coding of Memoranda by Ensembles of Prefrontal Neurons During Working Memory" Society for Neuroscience 2022
- K.J. Miller, L Freeman, **Jin Oh**, M.M. Botvinick, K.D. Harris. "Structured credit assignment in mice." The Multi-disciplinary Conference on Reinforcement Learning and Decision Making 2022 & Society for Neuroscience 2022
- A. Lebedeva, K.J. Miller, **Jin Oh**, K.D. Harris. "Neural Correlates of Reinforcement Learning Across the Brain." The Multi-disciplinary Conference on Reinforcement Learning and Decision Making 2022
- **Jin Oh**, K.J. Miller, A. Lebedeva, K.D. Harris. "Comparing cognitive models of dynamic reward learning in the head-fixed mouse." Society for Neuroscience 2021
- A. Lebedeva, K.J. Miller, **Jin Oh**, Y. Wang, K.D. Harris. "Recording neurons across the brain during a two-armed bandit task." Society for Neuroscience 2021
- **Jin Oh**, SV Srivatsa, K Lin, J Lucas, P. M Doraiswamy. "Proteomic Markers of Cognitive Decline in Subjects at Risk for Alzheimer's." The 2nd Annual Center for Aging and Human Development Research and Education Retreat 2017 & Society for Neuroscience 2017
- Byeol Kim, **Jin Oh**, Jessica Andrews-Hannah, Choong-Wan Woo. "Dynamic Modeling and Brain Decoding of Internal Thoughts and Emotions." Society for Neuroscience 2018

** indicates equal contribution*

AWARDS & SCHOLARSHIPS

- The 20th Ok Han-heum Scholarship ($6,000) Ok Han-heum Foundation, 2025
- The Korean Honor Scholarship ($1500) U.S. Embassy & Consulate in the Republic of Korea, 2024
- The Training Program in Theory and Computation Grant University of Chicago, 2024-25
- Kwanjeong Educational Foundation Scholarship ($30,000) Kwanjeong Educational Foundation, 2020

- Psychology & Neuroscience Undergraduate Travel Award ($1,500) Duke University, 2018
- Undergraduate Research Support Travel Grant ($420) Duke University, 2017
- The 11th Ok Han-heum Scholarship ($5,000) Ok Han-heum Foundation, 2016
- Dean's List (2014 Fall, 2016 Fall, 2017 Fall) Duke University

WORK EXPERIENCE

Google Korea (provided by Adecco Korea), Seoul, South Korea, *Market Insights Marketing Researcher* **January – May 2019**

- Spearheaded a qualitative market research project and meetings with market research companies to create effective strategies to optimize YouTube's advertisement techniques for cosmetics, OTT, and automobile industries.
- Created a qualitative research report to understand customer segmentation in the cosmetics industry and their behavior in department stores, along with their buying journey.
- Developed an overview report to understand the OTT industry in Korea.
- Developed and designed the Korea Market Insights Research Hub website.

LEADERSHIP EXPERIENCE

Student Representative, London, United Kingdom **September 2020 - September 2021**

- Represented the cohort by facilitating communication with staff regarding concerns and needs with the Master's program

Neuroscience Major Union Mentor Program, NC, United States, *Mentor* **August – December 2018**

- Met with two mentees weekly to discuss their future career in neuroscience as well as concerns about class materials.

LANGUAGES

English (Native); Korean (Native); Chinese (Advanced, HSK 5)