SungJun **Cho**

MSc Candidate at the University of Oxford

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Education

The University of Oxford — *Oxford, UK*

MSc Candidate in Psychiatry — *Oct 2022 - Present*

- Supervisor: Mark Woolrich

The University of Chicago — *Chicago, IL*

BS in Neuroscience & BA in Philosophy — *Sep 2016 - Jun 2020*

- GPA: 3.77 / 4.00
- Thesis: Theoretical modeling of neuronal networks: Paroxysmal depolarization and ictal wave propagations in focal epileptic seizures

Employments

AutoML Team | Lunit Inc. — *Seoul, S.Korea*

ML/DL Research Intern (PI: HyunJae Lee) — *Oct 2021 - May 2022*

- Conducted research focused on the hyper-parameter optimization (HPO) methods in medical image segmentation problems.
- Led an AutoML project to increase the accuracy of the chest X-Ray products using GCP APIs and several HPO frameworks (Optuna, Ray Tune, W&B)

Jee Lab | Korea Institute of Science and Technology — *Seoul, S.Korea*

Postgraduate Research Intern (PI: Jee Hyun Choi) — *Jul 2020 - Sep 2021*

- Evaluated efficiency of the burst detection algorithms in capturing precise temporal link between neural activities and behaviors.
- Identified behavioral correlates of neural oscillations in the mouse basolateral amygdala and prefrontal cortex, utilizing convolutional neural networks to estimate behavioral postures of rodents.

Research Experiences

Brain Dynamics Lab | The University of Chicago — *Chicago, IL*

Undergraduate Research Assistant (PI: Stephanie Cacioppo) — *Nov 2018 - Jun 2020*

- Led acquisition, preprocessing, and analysis of the ERP data acquired from the control subjects and hypoactive sexual desire disorder (HSDD) patients to investigate the Flibanserin-induced changes in brain activities.
- Identified menopause-dependent neural activation differences in HSDD patients during decision making processes by analyzing spatiotemporal dynamics of the electrophysiological data.

van Drongelen Epilepsy Lab | The University of Chicago — *Chicago, IL*

Undergraduate Research Assistant (PI: Wim van Drongelen) — *Oct 2018 - Jun 2020*

- Theoretically modelled ictal machinery of the focal epileptic seizures to understand the mechanism of the paroxysmal depolarization shift in parvalbumin inhibitory interneurons.
- Modified and developed a UI package for synchronous analyses of mouse respiration data and neural signals (measured from the medullary neurons).

Clinical Cognitive Neuroscience Center | Seoul National University — *Seoul, S.Korea*

Undergraduate Visiting Scholar (PI: Jun Soo Kwon) — *Jul 2018 - Sep 2018*

- Studied the functional and structural connectivity of the hippocampal-medial prefrontal circuitry based on the open-source fMRI and DTI data of the patients with schizophrenia.

Impression Formation Social Neuroscience Lab | The University of Chicago — *Chicago, IL*

Undergraduate Research Assistant (PI: Jasmin Cloutier & Jennifer Kubota) — *Nov 2016 - Jul 2017*

- Managed human behavioral experiments to investigate how people internally perceive and evaluate the social status of the others based on their personal prejudices.
- Analyzed behavioral data on how external motivation to respond without prejudice alters the neural processing of attention and decision making in response to the individuals' perceived race and status.

Cognitive Neurology and Dementia Lab | Samsung Medical Center — *Seoul, S.Korea*

Clinical Intern & Research Assistant (PI: DukRyul Na) — *Jul 2015 - Aug 2015*

- Assisted basic biological experiments to study the effect of intra-arterial administration of the mesenchymal stem cells on transgenic mice with Alzheimer's disease.

Publictions

Journal Articles

[1] Tryba AK, Merricks E, Lee S, Pham T, **Cho SJ**, Nordli Jr. DR, Eissa TL, Goodman R, McKhann G, Emerson R, Schevon C, van Drongelen W. (2019). The role of paroxysmal depolarization in focal seizure activity. *Journal of Neurophysiology*, 122(5): 1861-1873.

[2] Cho SJ, Choi JH. (In preparation). Comparison of algorithmic accuracy in detecting beta/gamma oscillatory bursts for the precise temporal linking between brain activities and behaviors.

Conference Papers

[1] Lee H, Kim J, Lee G, **Cho SJ**, Kim D, Yoo D. (2023). Improving Multi-fidelity Optimization with a Recurring Learning rate for Hyperparameter Tuning. In 2023 IEEE Winter Conference on Applications of Computer Vision (WACV).

Conference Posters

[1] **Cho SJ**, Choi JH. (2022). Decision-matrix based algorithm selection maximizes detection accuracy of transient neural oscillatory bursts. *Korean Society for Brain and Neural Sciences 2022*.

[2] **Cho SJ**, Lee J, Choi JH. (2021). Transient beta and gamma bursts in simulations and the mouse basolateral amygdala during the open field test. *Society for Neuroscience 2021*.

[3] **Cho SJ**, Choi JH. (2021). Comparison of burst detection algorithms for characterizing transient neural oscillatory events. *Korean Society for Brain and Neural Sciences 2021*.

[4] **Cho SJ**, Siewsrichol W, Cacioppo S. (2020). Neural Differences in Hypoactive Sexual Desire Disorder: An ERP Microstate Study. *Cognitive Neuroscience Society 2020*.

[5] van Drongelen W, Tryba AK, Pham T, Merricks E, Bhansali A, Pesce L, **Cho SJ**, Lee S, Eissa TL, Nordli Jr. DR, Schevon CA. (2019). Dynamics sustaining focal seizures: a dual function of inhibition and interactions across scales. *Society for Neuroscience 2019*.

Honors & Awards

2020 **Dean's Fund for Undergraduate Research - Conference,** The University of Chicago

2020 **Micro-Metcalf Internship Award,** The University of Chicago

2019 **Liew Family College Research Fellowship,** The University of Chicago

2018-19 **Jeff Metcalf Internship Award ,** The University of Chicago

2016-19 **Dean's List (3x times),** The University of Chicago

Teaching

University of Chicago — *Chicago, IL*

BIOS 10130 Core Biology (Nervous System) — *Spring 2018*

- Worked as a Teaching Assistant to supervise laboratory experiments, organize review sessions, and assist the lectures.

MATH 15200 Calculus II — *Fall 2020*

- Worked as a VCA course assistant to grade homeworks, organize review sessions, and host office hours.

Other Academic Experiences

Deep Learning Summer School — *Online*

Neuromatch Academy — *2021*

- Trained a DQN algorithm developed by Deepmind on a LunarLander environment imported from OpenAI Gym to explore the effect of hyperparameter tuning and reward shaping on the reinforcement learning tasks.

Phonology Laboratory — *Chicago, IL*

Department of Linguistics, The University of Chicago — *2020*

- Designed and implemented an online experiment to study the relationship between pitch and voice onset time (VOT) under the context of human speech perception.

Directed Reading Program — *Chicago, IL*

Department of Mathematics, The University of Chicago — *2019*

- Studied persistent homology and its application to the field of neuroscience and computer science under the context of algebraic topology.

Physician Shadowing Program *Chicago, IL*

The University of Chicago Medicine *2018-19*

- Shadowed Prof. Helene Rubeiz at the Department of Neurology and Prof. Nishant Agrawal at the Department of Surgery to observe various neuromuscular diseases and otolaryngology surgeries.
- Visited operating room under the guidance of Prof. Ross Milner (1/23/19): Endovascular Abdominal Aneurysm Repair (EVAR) of renal arteries.

Skills

Programming	Python, MATLAB, R, Julia, SQL, LaTeX
Research Software	ImageJ, FSL (FreeSurfer, MRtrix3), NetStation, Brainstrom
DevOps & Platforms	Qualtrics, Amazon MTurk, GitHub, Docker, Google Cloud Platform
Languages	English, Korean, Chinese (Mandarin)