

SungJun Cho

DPhil student at the University of Oxford

Webstie: <https://scho97.github.io/>

Email: sungjun.cho@ndcn.ox.ac.uk

Citizenship: Republic of Korea

Research Interests

computational neuropsychiatry, neural oscillations, neuroimaging, machine learning

Education

- Oct 2024 – Present **DPhil Clinical Neurosciences**
UNIVERSITY OF OXFORD, OXFORD, UK
Supervisors: Mark Woolrich, Oiwi Parker Jones
Thesis: *Developing interpretable attention-based generative models for neuroimaging data*
- Oct 2022 – Dec 2023 **MSc (by Research) Psychiatry**
UNIVERSITY OF OXFORD, OXFORD, UK
Supervisors: Mark Woolrich, Chetan Gohil, Mats van Es
Thesis: *Inferring brain network dynamics of MEG and EEG in healthy aging and Alzheimer's disease* [PDF]
- Sep 2016 – Jun 2020 **BS Neuroscience; BA Philosophy**
UNIVERSITY OF CHICAGO, CHICAGO, USA
Supervisors: Wim van Drongelen
Thesis: *Theoretical modeling of neuronal networks: Paroxysmal depolarization and ictal wave propagations in focal epileptic seizures*

Honors & Awards

- 2024-2028 **Medical Sciences Graduate School Studentship** – University of Oxford
Funded by the Medical Research Council, Hertford Claire Clifford Lusardi Scholarship, and Nuffield Department of Clinical Neurosciences.
- 2023 **Hertford College Graduate Travel Grant** – University of Oxford
- 2020 **Dean's Fund for Undergraduate Research - Conference** – University of Chicago
- 2019 **Liew Family College Research Fellowship** – University of Chicago
- 2016-2019 **Dean's List (3x times)** – University of Chicago

Publications

Asterisk (*) denotes equal contributions as a co-first or co-senior author.

JOURNAL ARTICLES

- [J1] **Cho S**, van Es M, Woolrich M, Gohil C. (2024). Comparison between EEG and MEG of static and dynamic resting-state networks. *Human Brain Mapping*, 45(13):e70018. [PDF]
- [J2] **Cho S***, Han HB*, Jung D, Kim J, Choi JH. (2024). Mouse Escape Behaviors and mPFC-BLA Activity Dataset: Understanding Flexible Defensive Strategies Under Threat. *Scientific Data*, 11:861. [PDF]
- [J3] **Cho S**, Choi JH. (2023). A guide towards optimal detection of transient oscillatory bursts with unknown parameters. *Journal of Neural Engineering*, 20(4):046007. [PDF]
- [J4] Tryba AK, Merricks E, Lee S, Pham T, **Cho S**, 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. [PDF]

CONFERENCE PROCEEDINGS

- [C1] Lee H, Kim J, Lee G, **Cho S**, Kim D, Yoo D. (2023). Improving Multi-fidelity Optimization with a Recurring Learning Rate for Hyperparameter Tuning. In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV): 2309-2318. [PDF]

MANUSCRIPTS IN SUBMISSION & PREPRINTS

- [M1] TBA

Research experience

- Oct 2022 –
Dec 2023 **MSc Student**
OXFORD CENTRE FOR HUMAN BRAIN ACTIVITY, OXFORD, UK
PI: Mark Woolrich
- Studied the efficacy of M/EEG-derived static and dynamic changes in whole-brain network features as a predictive biomarker of Alzheimer’s disease during its prodromal phase.
- Jul 2020 –
Oct 2021 **Postgraduate Researcher**
KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY, SEOUL, S. KOREA
PI: Jee Hyun Choi
- Compared and evaluated the performance of burst detection algorithms in precisely capturing neural oscillatory bursts from electrophysiological signals.
 - Studied behavioral correlates of neural oscillations in the mouse basolateral amygdala and prefrontal cortex.
- Nov 2018 –
Jun 2020 **Undergraduate Research Assistant**
UNIVERSITY OF CHICAGO, CHICAGO, USA
PI: Stephanie Cacioppo
- Investigated the Flibanserin-induced brain responses and the effects of menopausal status in hypoactive sexual desire disorder (HSDD).

- Oct 2018 – **Undergraduate Research Assistant**
 Jun 2020 UNIVERSITY OF CHICAGO, CHICAGO, USA
 PI: Wim van Drongelen
- Theoretically modelled travelling ictal waves in the focal epileptic seizures assuming the paroxysmal depolarisation shift in parvalbumin inhibitory interneurons.
- Jul 2018 – **Undergraduate Visiting Scholar**
 Sep 2018 SEOUL NATIONAL UNIVERSITY, SEOUL, S. KOREA
 PI: Jun Soo Kwon
- Analysed functional and structural connectivity of the hippocampal-medial prefrontal circuitry in schizophrenia using human fMRI and DTI data.
- Nov 2016 – **Undergraduate Research Assistant**
 Jul 2017 UNIVERSITY OF CHICAGO, CHICAGO, USA
 PI: Jasmin Cloutier & Jennifer Kubota
- Studied how internal perceptions of the social status and personal prejudices influence the neural processing of attention and decision making.
- Jul 2015 – **High School Research Assistant**
 Aug 2015 SAMSUNG MEDICAL CENTER, SEOUL, S. KOREA
 PI: DukRyul Na
- Examined the effect of intra-arterial administration of the mesenchymal stem cells on transgenic mice with Alzheimer’s disease.

Industry experience

- Oct 2021 – **ML/DL Research Intern (AutoML Team)**
 May 2022 LUNIT INC., SEOUL, S. KOREA
 PI: HyunJae Lee
- Conducted research focused on improving hyperparameter optimization (HPO) algorithms to solve medical image segmentation problems.
 - Led an AutoML project to increase the accuracy of the chest X-Ray products using HPO frameworks (Optuna, Ray Tune, W&B) and large-scale cloud computing.

Presentations

CONFERENCE POSTERS

- 2024 [OHBM] Correspondence of dynamic resting-state networks in source space EEG and MEG.
- 2023 [MEG-UKI] Comparison of resting-state EEG and MEG in detecting the effects of healthy aging. [\[PDF\]](#)
- 2022 [KSBNS] Decision-matrix based algorithm selection maximizes detection accuracy of transient neural oscillatory bursts. [\[PDF\]](#)
- 2021 [SfN] Transient beta and gamma bursts in simulations and the mouse basolateral amygdala during the open field test. [\[PDF\]](#)
- 2021 [KSBNS] Comparison of burst detection algorithms for characterizing transient neural oscillatory events. [\[PDF\]](#)

- 2020 [CNS] Neural Differences in Hypoactive Sexual Desire Disorder: An ERP Microstate Study.
- 2019 [SfN] Dynamics sustaining focal seizures: a dual function of inhibition and interactions across scales.

Teaching

- 2020 **MATH 15200 Calculus II**, *University of Chicago*
Course Assistant
- 2018 **BIOS 10130 Core Biology (Nervous System)**, *University of Chicago*
Teaching Assistant

Technical Skills

Theory

signal processing, machine learning, Bayesian analysis, biophysical modeling

Programming Languages

Python, MATLAB, R, Bash, Julia, SQL

Research Software

Data Analysis: FSL (FreeSurfer, MRtrix3), Brainstorm, MNE, FieldTrip, \LaTeX

Machine Learning: Tensorflow, PyTorch

DevOps: Qualtrics, Amazon MTurk, Git, Docker, Google Cloud Platform

Data

LFP, EEG, MEG, MRI, DTI (in mouse or human)

Languages

English, Korean, Chinese (Mandarin), French

Science Communication

- Apr 2024 [How scientists are building a library of the brain's dysfunctional pathways](#), *The Oxford Scientist*
- Mar 2024 [Redefining mental health: the rise of computational psychiatry](#), *The Oxford Scientist*