

# ZINONG YANG

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## EDUCATION

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**Boston University, Boston, MA**  
Ph.D. in Computational Neuroscience

*Sep 2019 - June 2025*

**Massachusetts Institute of Technology, Cambridge, MA**

*June 2023 - June 2025*

Graduate Visiting Student in Research Laboratory of Electronics and the Institute of Medical Engineering Systems

**University of California, San Diego, La Jolla, CA**

*Sep 2014 - June 2017*

Bachelor of Science in Cognitive Neuroscience

Minor: Philosophy

Honors degree: Cum Laude

## PUBLICATIONS

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- [1] J. Levitt, X. Zeng, **Yang, Z.**, L. Jacob, and L. Lewis, "Closed-loop auditory stimulation of sleep slow waves drives cerebrospinal fluid flow in humans," *under revision in Science Translational Medicine*, 2025.
- [2] **Yang, Z.**, S. Williams, E. Beldzik, S. Anakwe, E. Schimmelpfennig, and L. Lewis, "Attentional failures after sleep deprivation represent moments of cerebrospinal fluid flow," *Nature Neuroscience*, (accepted) 2025.
- [3] J. Levitt, **Yang, Z.**, S. Williams, S. Espinosa, A. Garcia-Casal, and L. Lewis, "EEG-LLAMAS: a low-latency neurofeedback platform for artifact reduction in EEG-fMRI," *NeuroImage*, 2023.
- [4] **Yang, Z.** and L. Lewis, "Imaging the temporal dynamics of brain states with highly sampled fmri," *Curr Opin Behav Sci*, 2021.

## ACHIEVEMENTS

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**Organization for Human Brain Mapping Merit Award**

*2024*

**Kavli Summer Institute in Cognitive Neuroscience Fellow, UCSB**

*Summer 2022*

## SKILLS

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<b>Human Neuroscience</b>	EEG, fMRI, fNIRS, Eyetracking, physiological timeseries analysis
<b>Artificial Intelligence</b>	Deep Learning, Large Vision Models, classical machine learning
<b>Programming Languages</b>	Python (Pytorch, Tensorflow, Sklearn, Pandas, Numpy), MATLAB (EEGLAB), R, git, Bash, C/C++
<b>Large-scale Computing</b>	SLURM, multi-gpu computing
<b>Languages</b>	Mandarin Chinese (Native), English (Proficient), German (Basic), Japanese (Basic)
<b>Others</b>	Adobe Acrobat Pro, Qualtrics, Microsoft Word, Excel, Photoshop, Film Editing, Cinematography

## PRESENTATIONS

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- [5] E. Beldzik, N. Cicero, D. Gomez, **Yang, Z.**, J. Iglesias, E. B, and L. Lewis, "Subcortical neuromodulatory circuits for joint regulation of sleepiness and vascular physiology," in *ESRS Sleep Europe*, 2026.

- [6] E. Beldzik, D. Gomez, N. Cicero, **Yang, Z.**, J. Iglesias, and L. Lewis, "Subcortical dynamics during failures in maintaining alertness after sleep restriction in the human brain," in *Sleep*, May 2025.
- [7] E. Beldzik, **Yang, Z.**, S. Williams, and L. D. Lewis, "Distinct spectral pattern of cognitive, drowsiness, and fatigue-related theta/alpha eeg activity during wakefulness," in *Sleep*, 2024.
- [8] **Yang, Z.**, S. Williams, N. Tacugue, Z. Valdiviezo, J. Hua, T. Ly, M. Aon, I. Vinal, E. Schimmelpfennig, N. Leonard, R. Huang, D. Zimmerman, J. Yee, and L. Lewis, "SWADEE: A GUI-based Tool for Slow Wave Activity Detection via EEG and Eyetracking," in *Society for Neuroscience*, San Diego, CA, 2022.
- [9] S. Williams, **Yang, Z.**, S. Anakwe, J. Licata, E. Schimmelpfennig, M. Bosli, N. Leonard, I. Vinal, M. Aon, Z. Valdiviezo, N. Tacugue, and L. Lewis, "Changes in osmolyte concentration and excitatory-inhibitory balance after 24 hours of total sleep deprivation," in *ISMRM MRS*, 2024.
- [10] S. Williams, **Yang, Z.**, S. Anakwe, Z. Valdiviezo, N. Tacugue, I. Vinal, E. Schimmelpfennig, M. Aon, M. Bosli, J. Licata, N. Leonard, M. Ruiz, H. Fitzgerald, M. Otto, and L. Lewis, "Fast fmri imaging of amygdala bold hemodynamics in major depressive disorder after 26 hours of total sleep deprivation," in *Society of Biological Psychiatry*, 2024.
- [11] E. Beldzik, **Yang, Z.**, S. Williams, and L. Lewis, "Elucidating the theta paradox: Distinct spectral characteristics of cognitive- and drowsiness-related increases in midfrontal theta eeg activity," in *Society for Neuroscience*, 2023.
- [12] A. van der Kouwe, H. Jeong, **Yang, Z.**, D. Straney, R. Frost, L. Lewis, and G. Bonmassar, "The MotoNet: An MRI-Compatible EEG Net with Embedded Motion Sensors," in *International Society for Magnetic Resonance in Medicine (ISMRM)*, 2022.
- [13] **Yang, Z.**, J. Pineda, I.-W. Shu, J. Onton, A. Rivas, N. Zhen, L. Ring, M. Bordyug, and F. Singh, "Update on a longitudinal pilot study to assess the effects of gamma neurofeedback on cognitive function in schizophrenia patients," in *Society for Neuroscience Meeting*, San Diego, CA, 2018.
- [14] E. Herrera, F. Singh, **Yang, Z.**, L. Ring, A. Amello, and J. Pineda, "Role of gamma neurofeedback in working memory of persons diagnosed with schizophrenia," in *Society for Neuroscience Meeting*, Washington, DC, 2017.
- [15] N. Dudeck, F. Singh, **Yang, Z.**, R. Cheng, R. Gosla, and J. Pineda, "Gamma neurofeedback synchrony training on working memory in schizophrenia," in *Society for Neuroscience Meeting*, 2016.
- [16] F. Singh, A. Smith, **Yang, Z.**, and J. Pineda, "Neurofeedback on working memory in schizophrenia patients," in *Society for Neuroscience Meeting*, San Diego, CA, 2016.

## RESEARCH EXPERIENCE

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### Lewis Lab for Imaging Brain Dynamics

Sep 2019 - June 2025

*Supervisor: Dr. Laura D. Lewis*

MIT

- Conducted 100+ simultaneous fast fMRI-EEG-Eyetracking scans with human participants and developed analysis pipelines to examine the multimodal dataset.
- Led non-invasive cerebrospinal fluid (CSF) after sleep deprivation project with a team of 10: investigated the relationship between brain's neural signals and brain's fluid signal.
- Developed a MATLAB software (SWEET) for detecting local sleep activities in human with EEG and Eyetracking and presented the result at Society for Neuroscience.
- Implemented an AI-based generative model with PyTorch for predicting neural activity and behavioral performance from physiological signals (e.g., heart rate, pupil diameter, skin conductance).

### Functional Neuroscience Lab

Jan 2015 - June 2019

*Supervisors: Dr. Jaime A Pineda and Prof. Fiza Singh*

UC San Diego

- Led a team of 5 undergraduate researchers to deliver EEG-based neurofeedback to treat schizoaffective disorders.
- Performed EEG data processing such as filtering, artifact rejection, source localization, time-frequency analysis, and independent component analysis.

- Utilized both the Cognionics Quick-20 dry-EEG electrode system and the wet electrodes to administer EEG recording and Neurofeedback training on schizophrenic and normal populations.
- Maintained and implemented experiments using stimulus presentation software such as Neurobehavioral System Presentation.
- Performed statistical analysis of neuropsychological test data using Excel and SPSS. Experience with Though Technology ProComp Infiniti EEG Suite, Version 6.0 and EEG data analysis using EEGLAB and NeuroGuide.

#### **de Sa Lab**

Jan 2018 - June 2019

*Supervisors: Dr. Virginia de Sa*

UC San Diego

- Contributed to the development of BCI P300 speller experiments with Python-based game design package SNAP.
- Set up Brain Products EEG system and helped conducting BCI motor-imagery experiments.

#### **Vision and Memory Lab**

Jan 2018 - June 2019

*Supervisors: Dr. Timothy Brady and Dr. Mark Schurgin*

UC San Diego

- Investigated the capacity of visual long-term memory leveraging behavioral psychological methods.
- Led behavioral experiments involving recruitment of and guidance to participants to complete a series of computer-based tasks while recording their outputs for further comparison/analysis.
- Performed advanced data analysis in MATLAB and R to analyze test results, generate receiver operating characteristic (ROC) curve and calculated area under the curve (AUC).

#### **AD HOC REVIEWER**

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Current Opinion in Behavioral Sciences, Academia Medicine and Health