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Zitong Lu 路子童

(Update by 02/2023)

Education Background

The Ohio State University — Columbus, Ohio, the United State
Ph.D. in Cognitive Neuroscience — Expected 2025
Department of Psychology
Graduate Minor in Statistics — Expected 2023
Department of Statistics
M.S. in Psychology — 2022
Department of Psychology
Advised by Julie D. Golomb
Vision and Cognitive Neuroscience Lab https://u.osu.edu/golomblab/

East China Normal University — Shanghai, China
M.S. in Cognitive Neuroscience — 2021
The Institute of Cognitive Neuroscience, School of Psychology and Cognitive Science
Advised by Yixuan Ku, Yong-di Zhou & Huimin Wang
Memory and Emotion Lab (now in Sun Yat-sen University) https://sysumelab.com

Northeastern University — Shenyang, China
B.E. in Software Engineering — 2018
Department of Software Engineering, Software College

Research Interests

Main topics:
(1) Neural and behavioral mechanisms of visual perception: Object-location binding, depth and 3D perception, generally spatial representation.
(2) Artificial neural networks in cognitive computational neuroscience: Inter-individual neural converters, brain encoding and decoding, reverse engineering to interpret neural mechanisms.

Using behavior, Eye-tracking, EEG, fMRI and computational methods (MVPA, RSA, IEM, pRF), and deep neural networks (CNN, VAE, GAN).

Working Experience

08/2022-
OSU EEG lab manager Dept of Psychology, The Ohio State University, Columbus, OH

09/2020-06/2021

Research Assistant Brain-Like Memory Group, Peng Cheng Laboratory, Shenzhen, China

05/2017-08/2017
Programmer (as Project Leader) iSoftStone corporation, Shenyang, China

Typical Research Projects

Generate your neural signals from mine: individual-to-individual EEG converters
Department of Psychology, OSU 01/2023 – 02/2023

Temporally dynamic representations of object relative and real-world size and depth
Department of Psychology, OSU 11/2022 –

The influence of a moving object's location on object identity judgements.
Department of Psychology, OSU 08/2022 –

Unfolding the spatiotemporal neural mechanisms of 3D perception in the human brain: an fMRI-EEG fusion study.
Department of Psychology, OSU 06/2022 –

The influence of task-irrelevant landmarks on spatiotopic localization and object-location binding.
Department of Psychology, OSU 03/2022 –

Dynamic saccade context triggers more stable object-location binding
Department of Psychology, OSU 09/2021 – 03/2022

Representation Comparisons between Human Brain and Hierarchical Deep Convolutional Neural Network in Face Perception Reveal a Fatigue Mechanism of Repetition Suppression
Institute of Cognitive Neuroscience, ECNU 09/2020 – 05/2021

Dynamic Object-based Encoding Mechanism in Visual Working Memory by EEG Decoding
Institute of Cognitive Neuroscience, ECNU 03/2019 – 03/2020

NeuroRA: A Python Toolbox of Representational Analysis from Multi-modal Neural Data
Institute of Cognitive Neuroscience, ECNU 03/2019 – Present, continuously updated

Website: https://zitonglu1996.github.io/NeuroRA/. (119 stars on GitHub!)

Publications

Lu, Z., Shafer-Skelton, A., & Golomb, J.D. (2022). Gaze-centered spatial representations in human hippocampus. ***Conference on Cognitive Computational Neuroscience 2022***. https://doi.org/10.32470/CCN.2022.1088-0

Lu, Z., & Ku, Y. (2020). NeuroRA: A Python toolbox of representational analysis from multi-modal neural data. ***Frontiers in Neuroinformatic****s*. 14:563669. https://doi.org/10.3389/fninf.2020.563669

Lu, Z. (2020). PyCTRSA: A Python package for cross-temporal representational similarity analysis-based E/MEG decoding. ***Zenodo***. https://doi.org/10.5281/zenodo.4273674

Lu, Z., & Golomb, J.D. (submitted). Generate your neural signals from mine: individual-to-individual EEG converters.

Lu, Z., & Ku, Y. (preprint). Facial representation comparisons between human brain and hierarchical deep convolutional neural network reveal a fatigue repetition suppression mechanism. BioRxiv. https://doi.org/10.1101/2023.01.02.522298

Zhang, M*., **Lu, Z***., & Wang, Z. (preprint). Behavioral and neural evidence of musical learning improving audiovisual matching ability. *PsyArXiv*. https://doi.org/10.31234/osf.io/w74nr

Lu. Z., & Golomb, J.D. (in preparation). Dynamic saccade context triggers more stable object-location binding.

Zhang, M*., **Lu, Z***., Otani, S., & Wang, Z. (in preparation). Transcultural differences in the neural correlates of Theory of Mind between Chinese and Japanese: an fMRI study.

Presentations

05/23/2023 Vision Sciences Society (VSS) 2023
[Poster] Examining Hering's theory for color responses in human V1 and V4

05/21/2023 Vision Sciences Society (VSS) 2023
[Poster] The influence of a moving object's location on object identity judgments

05/20/2023 Vision Sciences Society (VSS) 2023
[Poster] The influence of task-irrelevant landmarks on spatiotopic localization and object-location binding

12/31/2022 The 2nd Neural Network Interdisciplinary Forum 2022
[Talk] Facial representation comparisons between human brain and hierarchical deep convolutional neural network reveal a fatigue repetition suppression mechanism

11/12/2022 Society of Neuroscience (SFN) 2022
[Poster] Dynamic saccade context triggers more stable object-location binding

10/22/2022 OSU CCBS Retreat 2022
[Talk] Dynamic saccade context triggers more stable object-location binding

08/27/2022 Cognitive Computational Neuroscience (CCN) 2022
[Poster] Gaze-centered spatial representations in human hippocampus

05/17/2022 Vision Sciences Society (VSS) 2022
[Talk] Dynamic saccade context triggers spatiotopic object-location binding

12/06/2021 OSU CCBBI Research Day 2021
[Talk] Gaze-centered spatial representations in human hippocampus

11/11/2021 Society of Neuroscience (SFN) 2021
[Poster] Representation comparisons between human brain and hierarchical deep convolutional neural network in face perception reveal a fatigue mechanism of repetition suppression

08/27/2021 The European Conference on Visual Perception (ECVP) 2021
[Poster] Representation comparisons between human brain and hierarchical deep convolutional neural network in face perception reveal a fatigue mechanism of repetition suppression

06/27/2021 Centre for Cognition and Brain Science, University of Macau
[Talk] Using computational methods to explore the neural representational mechanism in cognitive neuroscience

06/08/2021 UNIQUE Student Symposium 2021
[Talk] Representation comparisons between human brain and hierarchical deep convolutional neural network in face perception reveal a fatigue mechanism of repetition suppression

12/28/2020 Dept of Biomedical Engineering, UESTC
[Talk] Representational Analysis for Cognitive Neuroscience based on NeuroRA

12/17/2020 Dept of Biomedical Engineering, Shenzhen University
[Talk] Representational Analysis for Cognitive Neuroscience based on NeuroRA

Toolboxes & Tutorials

NeuroRA toolbox:
https://zitonglu1996.github.io/NeuroRA/ (119 stars on GitHub!)
Citation: Lu, Z., & Ku, Y. (2020). NeuroRA: A Python toolbox of representational analysis from multi-modal neural data. *Frontiers in Neuroinformatics*. 14:563669. https://doi.org/10.3389/fninf.2020.563669

Python EEG data analysis handbook in Chinese:
https://github.com/ZitongLu1996/Python-EEG-Handbook (150 stars on GitHub!)

Programming & Experiment Skills

Computer Languages: Python, C, C++, MATLAB, Java, Julia

Software & Toolboxes: EEGLAB, MNE, SPM, FSL, Nibabel, Nilearn, NeuroRA, PyTorch
Experimental Experience: EEG, fMRI, Eye tracker and TMS

Honors & Awards

04/2022 CCBBI Gibson Research Award (**USD 3,000**, by OSU CCBBI)
08/2021 University Fellowship (**USD 30,000**, by OSU)
04/2021 Outstanding Graduate Student (**3%**, Department of Education of Shanghai City) (上海市优秀毕业生)
12/2019 Short-Term Overseas Research Scholarship (about **USD 7,000**, by ECNU)
12/2018 Third prize (**30%**, China Graduate Student Mathematical Contest in Modeling)
12/2017 Outstanding Graduate Student (**3%**, Department of Education of Liaoning Province) (辽宁省优秀毕业生)
11/2017 Second-Class Merit Scholarship (**13%**, by NEU)
04/2017 Meritorious Winner (**13%,** Mathematical Contest in Modeling, by the U.S COMAP)
12/2016 First-Class Liu Dajie & Fang Wenyu's Scholarship (**<1%**, **USD 1500**, by NEU)
11/2016 Provincial First Prize (**3%**, China Undergraduate Mathematical Contest in Modeling)
11/2016 First-Class Merit Scholarship (**3%**, by NEU)
04/2016 Honorable Mention (**30%**, Mathematical Contest in Modeling, by the U.S COMAP)
11/2015 Second-Class Merit Scholarship (**13%**, by NEU)

Ad Hoc Reviewer

Scientific Reports, Advances in Psychological Science, Conference on Cognitive Computational Neuroscience (CCN) 2022, Annual meeting of the cognitive science society (CogSci) 2023.