

# Xiangshu Wu

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## Research interests

I am deeply interested in the intersection of learning, computational modeling, machine learning and disease. I have a background in computer science and experience in intracranial EEG, MEG and fMRI. I am particularly interested in how the brain rapidly builds representations of our world. I am fascinated by questions such as how humans learn rapidly in a changing environment and how the brain achieves this rapid learning, and how this process is affected by disease.

Currently, I am conducting research on a one-shot memory task, using intracranial EEG to reveal the role of the hippocampus in facilitating memory when individual experiences reward prediction errors. Through this research, I'm trying to gain deeper insights into the dynamic mechanisms involved in one-shot learning and memory formation in the brain.

Ultimately, my lifelong career ambition is to advance our understanding of how the brain learns in a dynamic environment by combining computational models and cognitive experiments.

## Education

2020 – Present

**South China Normal University** – Guangzhou, China

Master-PhD Combined Program in Psychology

Mentors: Qi Chen. .

2016 – 2020

**South China Normal University** – Guangzhou, China

BE in Computer Science and Technology, *GPA: 3.78/4.5(5%)*.

2017 – 2020

**South China Normal University** – Guangzhou, China

BS in Applied Psychology (Secondary Degree)

## Publications

+ denotes equal contribution

2022

**Connectome-based predictive modeling of compulsion in obsessive-compulsive disorder.**

**Xiangshu Wu**+, Qiong Yang+, Chuanyong Xu, Hangfeng Huo, Carol A. Seger, Ziwen Peng\*, Qi Chen\*.

*Cerebral Cortex*, 33(4), 1412-1425..

2021 **Aberrant Rich Club Organization in Patients with Obsessive-Compulsive Disorder and Their Unaffected First-Degree Relatives.**

Ziwen Peng+\*, Xinyi Yang+, Chuanyong Xu, **Xiangshu Wu**, Qiong Yang, Zhen Wei, Zihan Zhou, Tom Verguts, Qi Chen\*.

*NeuroImage: Clinical*, 32, 102808..

2021 **Abnormal brain functional network dynamics in obsessive-compulsive disorder patients and their unaffected first-degree relatives.**

Ziwen Peng+\*, Ya Guo+, **Xiangshu Wu**, Qiong Yang, Zhen Wei, Carol A. Seger, Qi Chen\*.

*Human Brain Mapping*, 42, 4387-4398..

## Research experience

2022 – Present [\[Click here for more details\]](#) **Reward Prediction Error and Declarative Memory: an SEEG study**

Mentors: Qi Chen

Reward prediction errors (RPEs), the mismatches between reward expectation and reward outcome, are known to drive procedural learning. However, their role in declarative memory remains underexplored. This study aims to explore the role of reward prediction errors (RPE) in human one-shot declarative memory in the hippocampus.

June, 2024 • Presented at *The 11th Annual Conference on Research and Application of EEG and Neuroimaging*, QingDao, China

2023 – Present **Reward Prediction Error and Declarative Memory: an MEG study**

Mentors: Qi Chen

We also conduct a MEG version of the same experiments to explore the coordination of different part of brain.

## Technical skills

### Programming languages

Proficient in: matlab

Familiar with: Python, R,  $\text{\LaTeX}$

### Languages

English (fluent), Mandarin (native)