Chen Wei

Curriculum Vitae

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Research Overview

I am Chen Wei, a joint Ph.D. candidate in Psychology at the University of Birmingham and Southern University of Science and Technology, expected to graduate in November 2025. My research focuses on **modeling individual mental representations and behavioral intervention**, integrating generative artificial intelligence with active experimental design to uncover and model individual differences in perception, memory, decision-making, and emotion, as well as to explore computational mechanisms for behavioral intervention. More recently, my work has extended to developing self-evolving AI that learns from autonomously designed interactive environments, leveraging large language models to develop **mental world models**. This involves using active experimental design to elicit richer human feedback and multi-agent environments to simulate social interactions, aiming to deeply understand human minds and intervene in decision-making and behavior in everyday settings.

Homepage / *Google Scholar*

Education

2021–2025 **Joint Ph.D. in Psychology**.
- University of Birmingham, UK (Supervisor: Dietmar Heinke)
- Southern University of Science and Technology, China (Supervisor: Quanying Liu)

2014–2018 **BSc in Finance**.
- Southwestern University of Finance and Economics, China

Work Experience

2019–2021 **Research Assistant**.
- Southern University of Science and Technology, China (Supervisor: Quanying Liu)

Publications

*Note: * Equal contribution; † Co-corresponding authors.*

Peer-Reviewed Papers

[18] Haotian Deng, Sitian Wang, Ruxin Wang, **Chen Wei**†, Quanying Liu†. "When LLM Agents Disagree, Do Humans Mirror? Behavioral Comparisons on Moral Dilemmas" ***MIND (Oral)***, 2025.

[17] Jiachen Zou, **Chen Wei**, Quanying Liu, M Robinson. "Using AI-generatedAI-generated real-world objects to uncover the structure of visual memory" ***Journal of Vision***, 2025.

[16] Dongyang Li, Haoyang Qin, Mingyang Wu, **Chen Wei**†, Quanying Liu†. "Brain-FLORA: Uncovering Brain Concept Representation via Multimodal Neural Embeddings" ***ACMMM (Oral)***, 2025.

[15] **Chen Wei***, Chi Zhang*, Jiachen Zou, Haotian Deng, Dietmar Heinke, Quanying Liu. "Synthesizing Images on Perceptual Boundaries of ANNs for Uncovering and Manipulating Human Perceptual Variability" ***ICML***, 2025.

[14] Yuang Cao*, Jiachen Zou*, **Chen Wei**†, Quanying Liu†. "Dimensions of Vulnerability in Visual Working Memory: An AI-Driven Approach to Perceptual Comparison" ***CogSci***, 2025.

[13] Haotian Deng, Chi Zhang, **Chen Wei**†, Quanying Liu†. "Synthesizing Images on Perceptual Boundaries o ANNs for Uncovering Human Perceptual Variability on Facial Expressions" ***IJCNN (Oral)***, 2025.

[12] Jiahua Tang, Song Wang, Jiachen Zou, **Chen Wei**†, Quanying Liu†. "Uncovering the EEG Temporal Representation of Low-dimensional Object Properties" ***IJCNN (Oral)***, 2025.

[11] Dongyang Li, Haoyang Qin, Mingyang Wu, Jiahua Tang, **Chen Wei**†, Quanying Liu†. "RealMind: Advancing Visual Decoding and Language Interaction via EEG Signals" ***ICME (Oral)***, 2025.

[10] Dongyang Li*, **Chen Wei***, Shiying Li, Jiachen Zou, Quanying Liu. "Visual Decoding and Reconstruction via EEG Embeddings with Guided Diffusion" ***NeurIPS***, 2024.

[9] **Chen Wei***, Jiachen Zou*, Dietmar Heinke, Quanying Liu. "CoCoG-2: Controllable generation of visual stimuli for understanding human concept representation" ***IJCAI Workshop on Human Brain and Artificial Intelligence (Best Paper Award)***, 2024.

[8] **Chen Wei***, Jiachen Zou*, Dietmar Heinke, Quanying Liu. "CoCoG: Controllable Visual Stimuli Generation based on Human Concept Representations" ***IJCAI***, 2024.

[7] Youzhi Qu, Penghui Du, Wenxin Che, **Chen Wei**, Chi Zhang, Wanli Ouyang, Yatao Bian, Feiyang Xu, Bin Hu, Kai Du, et al. "Promoting interactions between cognitive science and large language models" ***The Innovation***, 2024.

[6] Youzhi Qu*, **Chen Wei***, Penghui Du, Wenxin Che, Chi Zhang, Wanli Ouyang, Yatao Bian, Feiyang Xu, Bin Hu, Kai Du, et al. "Integration of cognitive tasks into artificial general intelligence test for large models" ***iScience***, 2024.

[5] Song Wang, **Chen Wei**, Kexin Lou, Dongfeng Gu, Quanying Liu. "Advancing EEG/MEG Source Imaging with Geometric-Informed Basis Functions" ***EMBC***, 2024.

[4] Junjie Yu, Chenyi Li, Kexin Lou, **Chen Wei**, Quanying Liu. "Embedding decomposition for artifacts removal in EEG signals" ***Journal of Neural Engineering***, 2022.

[3] Haoming Zhang*, Mingqi Zhao*, **Chen Wei**, Dante Mantini, Zherui Li, Quanying Liu. "EEGdenoiseNet: A benchmark dataset for deep learning solutions of EEG denoising" ***Journal of Neural Engineering***, 2021.

[2] **Chen Wei***, Kexin Lou*, Zhengyang Wang, Mingqi Zhao, Dante Mantini, Quanying Liu. "Edge Sparse Basis Network: A Deep Learning Framework for EEG Source Localization" ***IJCNN (Oral)***, 2021.

[1] Haoming Zhang*, **Chen Wei***, Mingqi Zhao, Quanying Liu, Haiyan Wu. "A novel convolutional neural network model to remove muscle artifacts from EEG" ***ICASSP***, 2021.

Preprints & Under Review

[6] Haotian Deng, Sitian Wang, Ruxin Wang, **Chen Wei**†, Quanying Liu†. "When Proxy Agents Disagree, Do Humans Mirror? Manipulating Human Behavior in Moral Dilemmas through Agents" ***Under review at AAAI***, 2026.

[5] Chi Zhang*, Yulang Gao*, Jiachen Zou, **Chen Wei**†, Quanying Liu†. "When Agents Steer Human Perception: How AI-Selected Images Can Covertly Alter Judgment Disagreements" ***Under review at AAAI***, 2026.

[4] **Chen Wei**, Jiachen Zou, Chi Zhang, Jia Liu, Haiyan Wu, and Quanying Liu. "Artificial Intelligence-Driven Novel Paradigms for Psychological Research" ***Under review at Advances in Psychological Science***, 2025.

[3] Dongyang Li, Kunpeng Xie, Mingyang Wu, Yiwei Kong, Jiahua Tang, Haoyang Qin, **Chen Wei**†, Quanying Liu†. "MindPilot: Closed-loop Visual Stimulation Optimization for Brain Modulation with EEG-guided Diffusion" ***Under review at NeurIPS***, 2025.

[2] Song Wang*, Kexin Lou*, **Chen Wei***, Zhiyuan Sheng, Jiahao Tang, Kaining Peng, Shuhao Mei, Liang Chen, Dongfeng Gu, Quanying Liu. "Reconstructing whole-brain spatiotemporal dynamics using EEG/MEG Source Imaging with Geometric Constraints" ***Under review at Nat. Biomed. Eng.***, 2025.

[1] **Chen Wei***, Zhengyang Wang*, Zhichao Liang, Quanying Liu. "The focus and timing of COVID-19 pandemic control measures under healthcare resource constraints" ***medRxiv***, 2020.

Books

[1] Quanying Liu, **Chen Wei**, Youzhi Qu, Zhichao Liang. "Modelling and Controlling System Dynamics of the Brain: An Intersection of Machine Learning and Control Theory." In ***Systems Neuroscience***, Springer Nature, 2024: 63-87.

Teaching Experience

2023 Teaching Assistant, Machine Learning and Medical Engineering Applications, Southern University of Science and Technology, Shenzhen, China (Instructor: Quanying Liu)

2023 Teaching Assistant, Brain Intelligence and Artificial Intelligence, Southern University of Science and Technology, Shenzhen, China (Instructor: Quanying Liu)

2023 Teaching Assistant, Brain Signal Analysis and Feature Extraction Tutorial (Special Session: Deep Learning & AI Applications), Institute of Psychology, CAS, Beijing, China (Instructor: Quanying Liu)

Invited Talks

Dec 2024 **Understanding and Manipulating Human Perception by Generating Visual Stimuli**.
Max Planck Institute and Justus Liebig University Giessen invited by Martin Hebart

Aug 2024 **CoCoG: Controllable Visual Stimuli Generation Based on Human Concept Representations**.
IJCAI

Aug 2024 **CoCoG-2: Controllable generation of visual stimuli for understanding human concept representation**.
IJCAI Workshop on Human Brain and Artificial Intelligence

Jun 2024 **Using Visual Generation Models to Enhance Psychological Experimental Design**.
AI4Psych Seminar

May 2024 **Controllable Visual Stimuli Generation Based on Human Concept Representations**.
Tsinghua University (Invited by Dan Zhang)

May 2021 **Edge Sparse Basis Network: A Deep Learning Framework for EEG Source Localization**.
IJCNN

Awards

2024 IOP Top Cited Paper Award 2024

2024 IOP Trusted Reviewer

2024 Best Paper Award at IJCAI Workshop on Human Brain and Artificial Intelligence

2023 Award of Excellence for Poster Presentation, BME Research Day, Southern University of Science and Technology

2020 1st Prize on Guangdong Academic Forum – Biomedical Engineering Brain Science Symposium

Other Experience

Translator Farrell S., Lewandowsky S. *Computational Modeling of Cognition and Behavior.* Cambridge University Press, 2018. (Chinese Edition, contributed as one of the translators)

Initiator and Lecturer In July 2024, organized and delivered 8 youth-focused AI science popularization lectures at the Shenzhen Science Museum, attracting an audience of over 3,000 participants.

Service

Editorial Roles Guest Editor, Special Issue on "Foundation Models for Brain Science", *Tsinghua Science and Technology*, 2025

Conference Reviewer	NeurIPS, ICML, ICLR, AISTATS, AAAI, CogSci, ACMMM, IJCNN, AAAI Artificial Intelligence for Social Impact Track, IJCAI Workshop on Human Brain and Artificial Intelligence
Journal Reviewer	Neuroscience, Machine Learning: Science and Technology, Journal of Neural Engineering, Biomedical Physics & Engineering Express
Membership	Associate Member, Institute of Physics (IOP); Member, IEEE