Yirong Xiong

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Education

Ph.D in Neuroscience **2024 –**
Johns Hopkins University *Baltimore, USA*

M.Sc in Neural Information Processing **2021 – 2023**
Universität Tübingen *Tübingen, Germany*

- Summer school: The Computational Summer school on Modeling Social and collective behavior (COSMOS)

M.Sc in Psychology **2018 – 2021**
Beijing Normal University *Beijing, China*

- Summer school: Computational Neuroscience (neuromatch academy 2021)

B.Sc in Information Management and Information System **2014 – 2018**
Sun Yat-Sen University *Guangdong, China*

Research Experience

Max Planck Institute for Brain Research, Prof. Gilles Laurent **2023 – 2024**
Neural mechanisms of camouflaging in cuttlefish *Frankfurt, Germany*

- Design electrophysiological experiments on texture encoding in cuttlefish visual system.
- Analyze the network structure and properties of the medulla in the optic lobe of cuttlefish.

Max Planck Institute of Animal Behaviour, Dr. Vivek Hari Sridhar **2023 –**
Decision-making in spatial navigation *Konstanz, Germany*

- Simulated goal-directed navigation trajectory using ring attractor model.
- Study how stimuli uncertainty and computational noise modulate bifurcation dynamics.

Cluster of Excellence "Machine Learning", Dr. Charley Wu **2022 –**
Rate-distortion theory as a model of human selective memory *Tübingen, Germany*

- Designed an online compositional bandit experiment for representation learning.
- Designed an online experiment for value-based memory.
- Simulated attention-based reinforcement learning model to study expertise effect on value-based memory.

Institute for Neurobiology, Prof. Andrea Burgalossi **2023**
Electrophysiological diversity of head direction neurons in thalamus and presubiculum *Tübingen, Germany*

- Used unsupervised learning to cluster head direction cells based on neural activities.

Department of Computer Science, Dr. Anna Levina (Martius) **2022 – 2023**
Dissociated aperiodic and periodic neural dynamics during attention *Tübingen, Germany*

- Dissociated aperiodic and periodic neural dynamics using LFP data from V1 and V4 in spatial visual attention task.

Max Planck Institute For Ornithology, Dr. Daniela Vallentin **2022**
Juvenile song detection *Seewiesen, Germany*

- Developed juvenile song detection pipeline using DAS.
- Developed interactive tool to check annotation efficiently.

Institute for Neurobiology, Dr. Lena Veit **2021 – 2022**
UMAP labeling tool *Tübingen, Germany*

- Developed a Web-based tool for visualizing and relabeling syllables (Github link).

Pitch learning model project

- Disentangled factors in context-based pitch learning using regression models.

State Key Laboratory of Cognitive Neuroscience and Learning, Dr. Gaolang Gong **2018 – 2021**
Corpus Callosum Topography Based on dMRI (ccmapping.org) *Beijing, China*

- Developed a track-generating and filtering pipeline and obtained fibers passing through the corpus callosum and connecting left and right hemispheres.
- Generated individual corpus callosum topography (HCP-S1200), and established group-averaged validated topographic maps with different weighting methods.
- Developed a Web-based tool to provide full and interactive access to the topographic result.

Asymmetries of planum temporale predict lateralization of auditory-language processing

- Labelled planum temporale manually and draw masks of relative ROIs.

School of Information Management, Dr. Daifeng Li **2018**
Effects of Different Machine Learning Methods on ADHD classification *Guangdong, China*

Papers

Qin, Peipei, Bi, Qiuhui, Guo, Zeya, Yang, Liyuan, Li, HaoKun, Li, Peng, Liang, Xinyu, Luo, Junhao, Kong, Xiangyu, **Xiong, Yirong**, Sun, Bo, Ocklenburg, Sebastian, and Gong, Gaolang. "Microstructural Asymmetries of the Planum Temporale Predict Functional Lateralization of Auditory-Language Processing". In: *eLife* 13 (2024). DOI: 10.7554/eLife.95547.1.

Xiong, Yirong, Yang, Liyuan, Wang, Changtong, Zhao, Chenxi, Luo, Junhao, Wu, Di, Ouyang, Yiping, Thiebaut de Schotten, Michel, and Gong, Gaolang. "Cortical Mapping of Callosal Connections in Healthy Young Adults". In: *Human Brain Mapping* 45.3 (2024). DOI: 10.1002/hbm.26629.

Yang, Liyuan, Zhao, Chenxi, **Xiong, Yirong**, Zhong, Suyu, Wu, Di, Peng, Shaoling, Schotten, Michel Thiebaut de, and Gong, Gaolang. "Callosal fiber length scales with brain size according to functional lateralization, evolution, and development". In: *Journal of Neuroscience* 42.17 (2022). DOI: 10.1523/JNEUROSCI.1510-21.2022.

Bistere, Linda, Gomez-Guzman, Carlos, **Xiong, Yirong**, and Vallentin, Daniela. "Female vocal feedback promotes song learning in juvenile zebra finches". Nature Communications. Under review.

Conferences & Workshops

Evans, Dominic, Karimi, Ali, Elmaleh, Margot, Jiang, He, **Xiong, Yirong**, Medeiros, Sylvia, Gerhardt, Ben, Rencken, Simone, Georgiades, Sofia, and Laurent, Gilles. "Visual coding in Sepia officinalis". In: *Cephalopod Neuroscience Conference*. 2024.

Xiong, Yirong, Blanco-Hernandez, Eduardo, Balsamo, Giuseppe, and Burgalossi, Andrea. "Electrophysiological diversity of head direction neurons revealed by t-SNE multidimensional embedding". In: *Tübingen Systems Neuroscience Symposium*. 2023.

Xiong, Yirong, Moneta, Nir, Bányai, Mihály, and Wu, Charley M. "Selective memory for reward-relevant features is modulated by expertise during reward learning". In: *Conference on Cognitive Computational Neuroscience*. 2023.

Xiong, Yirong, Moneta, Nir, Nagy, David, Bányai, Mihály, and Wu, Charley M. "Selective memory for reward-relevant features is modulated by expertise during reward learning". In: *Learning and Decision-Making Workshop*. 2023.

Xiong, Yirong and Sridhar, Vivek H. "Understanding the Influence of Uncertainty and Noise on Spatial Decision Dynamics". In: *Conference on Cognitive Computational Neuroscience*. 2024.

Xiong, Yirong, Yang, Liyuan, Zhao, Chenxi, Luo, Junhao, Wu, Di, and Gong, Gaolang. "A population-based online interactive atlas of human brain callosal connectivity." In: *Organization for Human Brain Mapping (OHBM) Annual Meeting*. 2021.

Honors & Awards

IMPRS stipends (monthly stipend awarded by Max Planck Institute) – 2021
The First Prize Academic Scholarship of Beijing Normal University – 2020 & 2019
Scientific Research Contributions Scholarship of Beijing Normal University – 2019
Freshman Scholarship of Beijing Normal University – 2018

Skills

Programming Languages: Python, JavaScript, SQL, HTML/CSS, Stan, MATLAB, R
Neuroscience Tools: Psychtoolbox, Kilosort, FreeSurfer, FSL
Languages: Mandarin(native), English(fluent)

Hobbies

Electronic keyboard, marathon running, birdwatching, baking.