

## Education

### **M.Sc in Neural Information Processing** **2021 – 2023**

*Universität Tübingen* *Tübingen, Germany*

- Courses: Neural Dynamics, Machine Learning, Signal Processing, Neural coding, Neurophysiology, Animal Handling
- 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**

*Topology and dynamics of camouflage in cuttlefish* *Frankfurt, Germany*

- Estimate the topology of camouflage in high dimensional space and investigate the dynamics of behaviour trajectory.
- Conduct experiments on camouflage behaviour.

### **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.
- Identified cell preferences for clockwise and counterclockwise rotation, to study evolving of head direction representation in rodents.

### **Max Planck Institute of Animal Behaviour, Dr. Vivek Hari Sridhar** **2023 – present**

*Drifting and reorientation in ring-attractors* *Konstanz, Germany*

- Built ring attractor model and simulated spontaneous network activities.
- Study drift and reorientation for goal-oriented navigation movement and its influence on synaptic strength.

### **Cluster of Excellence "Machine Learning", Dr. Charley Wu** **2022 – present**

*Rate-distortion theory as a model of human representation learning* *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.

### **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*

- Designed juvenile song detection pipeline using DAS.
- Designed UMAP 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 using Mrtrix3. Obtained fibers passing through the corpus callosum and connecting left and right hemispheres.
- Generated individual corpus callosum topography based on HCP S1200 Database, and established group-averaged validated topographic maps with different weighting methods.
- Designed a Web-based tool to provide full and interactive access to the topographic result using Three.js, WebGL, and Node.js.

*Asymmetries of planum temporale predict lateralization of auditory-language processing*

- Defined 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*

- Classified ADHD and control group using SVM, Logistic, CNN.

## Papers

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- Xiong, Yirong**, Moneta, Nir, Bánya, Mihály, and Wu, Charley M. “Selective memory for reward-relevant features is modulated by expertise during reward learning”. In: (2023). *Conference on Cognitive Computational Neuroscience*.
- 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).
- Bistere, Linda, Gomez-Guzman, Carlos, **Xiong, Yirong**, and Vallentin, Daniela. “Female vocal feedback promotes song learning in juvenile zebra finches”. *Nature Communications*. Under review.
- Qin, Peipei, Bi, Qiuhui, Luo, Junhao, Guo, Zeya, Yang, Liyuan, Li, Haokun, Li, Peng, Liang, Xinyu, Kong, Xiangyu, **Xiong, Yirong**, Sun, Bo, Ocklenburg, Sebastian, and Gong, Gaolang. “Microstructural asymmetries of the planum temporale predict functional lateralization of auditory-language processing”. *Cell Press Multi-Journal Submission*. Under review.
- Xiong, Yirong**, Yang, Liyuan, Wang, Changtong, Zhao, Chenxi, Luo, Junhao, Wu, Di, Ouyang, Yiping, Schotten, Michel Thiebaut de, and Gong, Gaolang. “Population-based cortical mapping of callosal connections in the human brain”. *Human Brain Mapping*. Under review.

## Conferences & Workshops

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- 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, Bánya, 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, Bánya, 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**, 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

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IMPRS stipends (monthly funding for IMPRS 5-Year MSc/PhD program) – 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

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**Programming Languages:** Python, JavaScript, SQL, HTML/CSS, Stan, MATLAB  
**Brain Imaging Tools:** FreeSurfer, FSL  
**Languages:** Mandarin(native), English(fluent)

## Hobbies

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Electronic keyboard, marathon running, birdwatching, baking.