Chongwen Wang

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EDUCATION

XI'AN JIAO TONG-LIVERPOOL UNIVERSITY September 2019 – Present

Bachelor of Science (Information and Computing Science) Suzhou, China

- Main coursework domains: Computer Science; Mathematics; Statistics; Machine Learning; Statistical Mechanics

RESEARCH

RESEARCH INTERNSHIP IN COMPUTATIONAL NEUROSCIENCE July 2023– Present

Fairhall Lab *Supervisor: Adrienne Fairhall*

https://fairhalllab.com/ University of Washington, Seattle

- Research Project in Computational Neuroscience
  1. Performed neuronal network simulation with gap junctions to simulate early development of neural assemblies and its implications in computation.
  2. Simulated different conditions of how the synfire chain in HVC could emerged from random connected neuronal network and how the new neurons could be integrated to the chain with the help of gap junctions.
- Weekly progress presentation and journal club on recent and classic work of computational neuroscience. Participate in discussions with other UW computational neuroscience center's PhD students and postdocs on their respective projects.

VISITING STUDENT IN COMPUTATIONAL NEUROSCIENCE February 2022– January 2023

Lab of Computational Neuroscience *Supervisor: Songting Li, Douglas Zhou*

http://lcns-sjtu.github.io/ Shanghai Jiao Tong University, Shanghai

- Research Project in Computational Neuroscience
  1. Constructed point-like bilinear integration models using Brainpy.
  2. Simulated the CA1 pyramidal neuron model and tested bilinear integration rule in dendritic computation using NEURON.
  3. Built neuronal network with bilinear integration neuron model through a library algorithm using NEURON.
  4. Applied bilinear rules in the realistic neuron to artificial neural network and explained self-attention and attention modules.
- Weekly progress presentation and journal club on recent and classic work of computational neuroscience. Reproduced intact theoretical results in theoretical neuroscience textbooks including "Neuronal Dynamics: From single neurons to networks and models of cognition", "Theoretical Neuroscience" and "Statistical Mechanics of Learning - Discontinuous Learning" by myself.

RESEARCH ASSISTANT IN COGNITIVE COMPUTATIONAL NEUROSCIENCE September 2021– January 2022

Lab of Cognitive Computational Neuroscience and Neuroimaging *Supervisor: Ru-Yuan Zhang*

https://ruyuanzhang.github.io/ Shanghai Jiao Tong University, Shanghai

- Research Project in Computational Neuroscience
  1. Built deep learning models for RPM(Raven's Progressive Matrices) with self-supervised learning.
  2. Applied neuroscience-inspired DNN models for RPM.
- Weekly progress presentation and journal club on recent works of cognitive computational neuroscience and abstract reasoning.

RESEARCH STUDENT IN DEEP LEARNING September 2020– August 2021

Lab of Cognitive Computation and Applied Technology *Supervisor: Kaizhu Huang, Xi Yang*

http://www.premilab.com/MainPage.ashx Xi'an JiaoTong-Liverpool University, Suzhou

- Research Project in Computer Vision
  1. Improved zero-shot recognition performance with generative models and causality methods.
- Weekly meeting and presentation on recent and classic research articles of deep learning and causality machine learning. Reproduced intact theoretical and experimental results in Machine Learning and Deep Learning textbooks including "Pattern Recognition and Machine Learning", "Deep Learning" by myself.

COURSEWORK RESEARCH IN STATISTICAL MECHANICS OF NEURAL NETWORK September 2022 – June 2023

Statistical Mechanics of Neural Network and Theoretical Neuroscience *Supervisor: Haiping Huang*

http://www.labxing.com/lab/666/news/677 Sun Yat-sen University, Online

- Attended Twenty-seven lectures given by researchers weekly about the elements of Statistical Mechanics and its application in neural theory(i.e. Cavity Method, Dynamical Mean Field Theory, Random Matrix Theory etc).
- Reproduced classical theoretical results including statistical mechanics of neural network theories and wrote code to test(i.e. Maximal Entropy Model and different sampling algorithms with retinal data).
- Wrote a review about Modeling Purkinje cell with Perceptron and Computing its optimal weight distribution with Replica method and Cavity method.

WORKSHOP IN COMPUTATIONAL NEUROSCIENCE August 2023

1st Neural Computation Modeling and Coding Workshop Peking University, Online

https://meeting.cns.org.cn/NCMP/

- Attended fourteen tutorials given by researchers(Si Wu, etc.) about modeling neural dynamics and coding details with Python.
- Finished coding coursework including simulating Reservoir Network, EI balanced Network, Spiking Neural Network and different neuron/synapse models with Python(Brainpy).

WINTER SCHOOL IN COMPUTATIONAL NEUROSCIENCE January 2022, 2023

11th ,12th Computational Neuroscience Winter School Shanghai Jiao Tong University, Online

https://ins.sjtu.edu.cn/conferences/2011

- Attended nine seminars given by researchers in computational neuroscience. (David Hansel, Nicolas Brunel, Xiao-Jing Wang, etc.)

EXTRACURRICULAR

POPULAR SCIENCE PROMOTION 2019 – present

- Answers and Articles on Computational Neuroscience and Deep Learning reached 120,000 reads on Zhihu (Chinese version of Quora)

SKILLS AND OTHERS

- **Languages**: Mandarin (Native), English (Fluent)
- **Programming**: Python (Pytorch, Numpy, Brainpy, Scipy, Matplotlib, Pandas), MATLAB, NEURON, LATEX, C++