

JIZHENG DONG

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EDUCATION

Department of Mathematics, Nanjing University Sep 2016 - Jun 2020
B.S. in Information and Computational Science (Applied Mathematics) GPA 4.23/5.00

RESEARCH INTEREST

Behavior Analysis, Neural Data Analysis, Synaptic Plasticity, Connectome

PUBLICATION AND PRESENTATION

Poster: Gesture analysis during social interactions in Drosophila Oct 2021
J Ning, J Dong, X Zhang, Z Li, J Wang, D Chen, Q Liu, Y Sun
CSHL Neurobiology of Drosophila, 2021

RESEARCH EXPERIENCE

Lab of Systems Neuroscience & Neuroengineering, Westlake University Oct 2020 - Present
Research Assistant, supervised by Professor Yi Sun Hangzhou, China

- **Project: 3D Behavior Recording of Drosophila**
- Real-time 2D key points detection of Drosophila and computational reconstruction of 3D posture based on detection result of 2D key points from multi-view cameras.
- Training convolutional neural network to predict 3D posture based on monocular top-view image for multiple animals.
- **Project: Visual-motor Transformation During Courtship**
- Behavior classification by k-means clustering method and data visualization by Uniform Manifold Approximation and Projection (UMAP).
- Statistical measurement for male-female relationship in different behaviors.
- Motion coordination analysis on how flies coordinate different body parts to produce movement, including forward walking, crab walking, wing extension.
- **Project: Motif of Neural Network**
- Mining of Hemibrain database (a synaptic-level connectome of Drosophila), extracting network motifs using graph theory tools.

Institute of Nanshu, Nanjing University Aug 2020 - Sep 2020
Research Intern, supervised by Professor Ting Wu Nanjing, China

- **Project: Steel Defect Detection**
- Defect detection of industrial steel products using segmentation model of CNN.

Department of Computer Science, Nanjing University Dec 2019 - May 2020
Research Intern, supervised by Professor Yang Gao Nanjing, China

- **Project: Defense of Adversarial Attacks**

- Modification of neural network structure to defend adversarial attacks based on the theory and method of filter and edge detection.
- Design of a Hebbian rule inspired recurrent module for the network and resulting discovery of the similarity between attacked images and the module modified images, which may be the attention of neural network during classification.

Institute of Brain and Cognitive Science, NYU Shanghai

Research Intern, supervised by Professor Sukbin Lim

Jul 2019 - Aug 2019

Shanghai, China

- **Project: Inferring Synaptic Plasticity Rule**
- Development of a computational method to infer synaptic plasticity rule under the assumption of random connection in recurrent neural network.
- Feasible explanations for the information storage mechanism in the neural network upon receiving several different stimuli.

Undergraduate Innovation Project, Nanjing University

Group Leader, supervised by Professor Jun Wang

Sep 2018 - Jan 2019

Nanjing, China

- **Project: Machine Learning Based Protein Prediction**
- Feature information extraction from the protein sequences.
- Protein structure prediction using LSTM.

Institutes of Brain Science, Fudan University

Research Intern, supervised by Professor Jiayi Zhang

Jul 2018 - Aug 2018

Shanghai, China

- **Project: Imitation Behavior of Rodents**
- Construction of experimental equipment using Raspberry Pi, cameras, and mechanical sensors for mice behavior recording.
- Correlation analysis between the chewing behavior and vision of mice under peer influence.
- Image processing algorithm for the dyed neurons counting.

HONORS AND AWARDS

The National Basic Subject Top-notch Talent Scholarship
The People's Scholarship in China

SKILLS AND HOBBIES

Programming	Python, MATLAB, R, C++
CS	Image Processing, SQL, LaTeX, Deep Learning(PyTorch, TensorFlow)
Leadership	Vice-Chairman of NJU Leadership Club, Originator of <i>Flint</i> Interdisciplinary Colloquium
Sports	Archery, Marathon