# 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 Analysis**
· Multiple approaches for realtime keypoints detection of fruit fly for different needs of speed and precision, and the 3D pose reconstruction in free behaving fruit flies.
· Trajectory tracking and analysis of fruit fly in chamber to quantitatively parameterize the dynamic changes of position, speed and orientation.
· **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** Jul 2019 - Aug 2019
*Research Intern, supervised by Professor Sukbin Lim* *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** Sep 2018 - Jan 2019
*Group Leader, supervised by Professor Jun Wang* *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** Jul 2018 - Aug 2018
*Research Intern, supervised by Professor Jiayi Zhang* *Shanghai, China*

· **Project: Imitation Behavior of Rodents**
· Construction of experimental equipment using Raspberry Pi and 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

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

## RELEVANT COURSES

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|---|---|
| **Applied Mathematics** | Numerical Methods and Experiments, Partial Differential Equations,<br>Numerical Methods of PDE |
| **Biology & Neuroscience** | Introduction to Neuroscience, Cell Biology,<br>Basic Biological Technology, Computational Neuroscience |
| **Statistics** | Probability Theory, Mathematical Statistics,<br>Multivariate Statistical, Biostatistics |