Du Fengtong(Farah)

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EDUCATION

PhD in Neuroscience **2021-present**

Johns Hopkins University and HHMI Janelia Research Campus

- Supervised by Carsen Stringer

MS in New Artificial Intelligence and Media Technology **2017-2021**

Neuroscience and Intelligent Media Institute, Communication University of China

- GPA: 3.9/4.0. Rank 1st. Supervised by Prof. Lihong Cao
- National Scholarship for Graduate students
- Thesis: A study on brain-inspired continuous learning method

BS in Digital Media Technology **2013-2017**

Communication University of China

- Outstanding Graduate Student, Communication University of China
- Outstanding Bachelor's Dissertation, Communication University of China
- Thesis: Bullet hole detection using series Faster-RCNN and video analysis

TEACHING EXPERIENCE

Cajal NeuroAI summer school, TA **2025.7**

- Answering questions about methods for analyzing neural recordings, scheduling classes and advice on research projects.

Neuromatch Academy summer school, computational neuroscience TA **2021.7**

- Answering questions about methods for analyzing neural recordings, scheduling classes and advice on research projects.

Neuromatch Academy summer school, computational neuroscience TA **2020.7**

- Answering questions about methods for analyzing neural recordings, scheduling classes and advice on research projects.

Mathematics in Neuroscience, CUC, TA **2018**

- Organizing and supplementing the lecture notes about mathematical methods commonly used in computational neuroscience research.

Python course for art students: game development, CUC, TA **2018**

- Served as a TA for the python course for graduate students majoring in arts and sciences, teaching Python syntax basics and preparing lesson projects based on pygame.

RESEARCH AND CAREER EXPERIENCE

HHMI Janelia, Stringer Lab, Research Intern **2020.6 – 2021.8**

- Analyze neural response to textures in mice visual cortex.

Fujitsu Research and Development Center, Reaserch Intern **2020**

- Solving the few-shot domain transfer problem, propose a dataset extending method based on GAN.

International Collegiate Competition for Brain-inspired Computing, Third Prize **2019**

Beijing Institute of Collaborative Innovation, Intern **2016-2017**

- Intelligent Video Analysis Project: Use Faster-RCNN to detect specific targets in football and basketball game videos, provide a C++ interface for the development of the intelligent video analysis platform
- Gastroscope automatic diagnosis project: Corporate with Beijing Friendship Hospital and Beijing Huaxinjiayin medical technology development co. LTD. Detect gastric cancer and gastric atrophy lesions from gastroscopic input video.

PROJECT

CLight——Capsule Space Light Environment Control System, team leader **2018**

- Lead a five-member team from different disciplines. Design an app that can control the lighting environment in small living spaces automaticlaly, it is designed for improving the comfortableness of living space for young people and the poor.

Visual comfort measurement software, developer **2017**

- Design visual comfort measurements for media facade videos.

Beijing Training Programs of Innovation and Entrepreneurship for Undergraduates **2015**

- Capture human movements with Kinect and make the cartoon character perform the same actions as the person.

National Training Programs of Innovation and Entrepreneurship for Undergraduates **2015**

- Develop a brand recommendation application that shows brand information by scanning the logo of that brand.

PUBLICATIONS

Fengtong Du*, M Ángel Núñez-Ochoa, M Pachitariu*, C Stringer*, A simplified minimodel of visual cortical neurons, Nature Communications, 2025

- Developed a two-layer single-neuron “minimodel” that accurately predicts mouse visual cortical responses, bridging image-computable models with biological neurons.

C Stringer, L Zhong, A Syeda, **Fengtong Du**, M Kesa, M Pachitariu*, Rastermap: a discovery method for neural population recordings, Nature Neuroscience, 2025

- Introduced a dimensionality reduction and visualization method for large-scale neural recordings, enabling discovery of structure in population activity.

L Chen, S Zhu, W Chen, L Min, Y Zhao, **Fengtong Du**, S Guo, J Xing, Z Zhang, M Ji*, Gastroenterologist-level detection of gastric precursor lesions and neoplasia with a deep convolutional neural network, MedRobot, 2023

- Built a deep CNN system achieving gastroenterologist-level accuracy in detecting gastric precursor lesions and neoplasia from endoscopic images.

Fengtong Du, Sonia Joseph, Marius Pachitariu*, Carsen Stringer*, *Invariant texture recognition in mouse visual cortex*, submitted, cosyne 2021

- Decode texture classes from the neural activity of mice visual cortex, and compare the results with CNN.

Lihong Cao*, **Fengtong Du**, Wenjie Chen, *A neural assembly learning method for concept-like cells formation and continual learning*, *Granted Invention Patent,* National Intellectual Property Administration of China (CNIPA), Patent No. ZL202110427115.9, 2021

- Propose a non-backpropagation weight updating strategy to avoid catastrophic forgetting.

Wenjie Chen, **Fengtong Du**, Ye Wang, Lihong Cao*, A *biological plausible audio-visual integration model for continual lifelong learning*, IJCNN, 2021, [link]

- we studied the mechanism of multi-modal learning in human MTL. Based on the HH equation, multi-compartment neuron, and Synaptic Tagging and Capturing(STC) learning rule, we proposed the Visual-Audio Integration Model(AVIM) and applied it to the continuous learning task.

Wenjie Chen, **Fengtong Du**, Ye Wang, Lihong Cao*, *Predropout&Inhibition: A Brain-Inspired Method for Convolutional Neural Network*, CISP, 2018, [link]

- Propose a method named predropout that makes the feature coding neurons of the same category more unified by changing the random dropout to a fixed dropout.

Fengtong Du*, Yanzhuo Zhou, Wenjie Chen, Lei Yang, *Bullet hole detection using series Faster-RCNN and video analysis*, ICMV, 2019, [link]

- Detect bullet holes in a 4mx4m target, propose a cascade Faster-RCNN for detecting tiny objects precisely.

Xinyi Zhou*, Wei Gong, WenLong Fu, **Fengtong Du**, Application of deep learning in object detection, ICIS, 2017, [link]

- Detect specific targets in football and basketball game videos based on the Faster-RCNN network.

SKILLS

- Programming: Python (PyTorch, TensorFlow, PyQt), MatLab, C/C++, HTML/CSS, JavaScript
- Languages: English-fluent, Mandarin-native