Binxu Wang

Neuroscience Ph.D. Candidate

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EDUCATION

BSc in Physics, **Peking University**, Beijing, China   Sep 2013- July 2018
   Major GPA: 3.78/4.0 (top 12% in Department of Physics)

Ph.D. candidate in Neuroscience, **Washington University in St Louis,** US   Sep 2018- Sep 2021
   GPA: 3.87/4.0

Brains, Minds & Machines Summer Course, Woods Hole.   Aug 2021

Visiting Grad Student† in Neurobiology, **Harvard Medical School,** US   Sep 2021- Now
   Moved to HMS with thesis advisor Carlos R. Ponce

PUBLICATION

Peer Reviewed

Wang, B., Ponce, C. R., (2021), A Geometric Analysis of Deep Generative Image Models and Its Applications. *International Conference on Learning Representations*, arXiv: 2101.06006.

Shao, Y†., **Wang, B.†,** Sornborger, A. T., Tao, L., (2019), A mechanism for synaptic copy between neural circuits. *Neural Computation*, 31(10), doi: 10.1162/neco_a_01221

Xiao, Z.†, **Wang, B.†,** Sornborger, A.T., Tao, L., (2018) Mutual Information and Information Gating in Synfire Chains, *Entropy,* 20(2), 102, doi: 10.3390/e20020102

Conference Poster

Wang, B., Ponce, C. R., (2021), Climb High and Gaze Far: mapping tuning landscapes of the ventral stream via image optimization and manipulation, poster at *Bernstein Conference 2021*, doi: 10.12751/nncn.bc2021.p206

Shao, Y., **Wang, B.**, Andrew, T., Tao, Louis, (2018), A mechanism for synaptic copy between neural circuits, poster at *Society for Neuroscience*, doi: 10.1101/351114

†: *Equal contribution*

FELLOWSHIP AND AWARDS

2021   Fujitsu Laboratories Fellowship for Brains, Minds and Machines Summer Course.
2019-21 Cognitive, Computational, and Systems Neuroscience Pathway Traineeship in Washington University
2018   Excellent Graduate in the City (Beijing) (*Highest Honor for Graduates in Peking University*)
2016-17 Peking University Merit Student Award
2014-15 Peking University Academic Excellence Award
2015-17 Peking University Physics Department WeiMingXueZi Scholarship
2014-16 Peking University Guanghua Scholarship
         (*Both scholarships are merit-based, awarded for academic excellence*)

INVITED TALK

2021   AI Time organization (virtual) https://youtu.be/IksDG84seng
2021   CCN 2021: What constitutes understanding of ventral pathway function? GAC panel discussion https://youtu.be/v8dyIk0pEaY

SERVICE

2020   Invited for journal article review for Cognitive Neural Dynamics; Assisted review for PLOS Computational Biology

TEACHING
2020   Teaching assistant for BIO5648 Coding and Statistical Thinking in the Neurosciences, in Washington University in St Louis
Gave a lecture on the application of bootstrapping methods in neuroscience.
2021   Teaching assistant for NEURO120 Introduction to Computational Neuroscience, in Harvard University
Held a one-hour review section each week.

SKILLS
Computational Skills
- Adept in Python, Matlab for data analysis, statistical learning, deep learning tasks. Fluent in Julia, R for image processing, statistical analysis, and model fitting tasks.
- Adept in PyTorch, have used it to develop and evaluate models of biological visual neurons, visualize and interpret GANs and CNNs, and build biological inspired self-supervised learning system.
- Have use TensorFlow and Keras framework to build and train Floodfill network models for Electron Microscopy 3D Image Segmentation, 2D tissue classification.
- Understand daily usage of Linux system and HPC cluster parallel computing.

Coursework
- **Mathematics**: Methods of Mathematical Physics (Complex function and PDE), Mathematical Statistics, Nonlinear Dynamics for Physicists, Topology, Differential Geometry, Nonlinear Dynamic System.
- **Physics:** General Relativity, Quantum Field Theory, Gauge Field Theory.
- **Computation**: Optimization Algorithms for Big Data Analysis, Deep Learning: Algorithm and Application, Computer Vision, Advances in Computer Vision, Introduction to Artificial Intelligence.

Experimental Skills
- Light-sheet microscopy (volumetric imaging) for transparent samples.
- *In vivo* electrode array recording on awake monkey.
- Monkey behavioral task design by MonkeyLogic.
- zTree human behavior task design.

LANGUAGE
- Fluent in mandarin and English.
- Could parse classical Latin.