Julia Wang, PhD

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PROFESSIONAL PROFILE

Machine learning scientist with degrees in computer science (Stanford, BS) and computational neuroscience (Cold Spring Harbor Laboratory, PhD). Passionate about telling stories with data, modeling, and theory to understand how intricate systems work. Over 7 years of machine learning research experience which includes applying deep learning to real-world biological questions, such as drug interaction, sleep signals, multi-omic genomics and imaging data, and more.

TECHNICAL SKILLS

- **AI/ML Tools**: HuggingFace, PyTorch, TensorFlow, Flax/Jax, Weights & Biases, Hyperopt
- **Programming Languages**: Python, C++, C, Java, Matlab, SQL, Arduino, CSS/HTML
- **Data science and visualization**: numpy, matplotlib, seaborn, plotly
- **High Performance Computing & Cloud Computing**: Slurm, AWS, Google Cloud
- **Relational Databases**: Snowflake, MySQL, pandas

EDUCATION

PhD	**Cold Spring Harbor Laboratory (CSHL)**, Computational Neuroscience	2023
BS	**Stanford University**, Computer Science (Artificial Intelligence)	2019

EXPERIENCE

Machine Learning Research Scientist | Output Biosciences 2025-present

- Developed **end-to-end LLM models** for multiple scales of biology, from molecules to proteins.
- Worked closely with a team of data scientists, wet-lab biologists, and other machine learning experts.

Neuroscience Research Fellow | Albert Einstein College of Medicine, Bronx, NY 2024-2025

- Training neuroscience inspired AI models of **communication between brain areas**.
- Utilizing mechanistic **interpretation** of **computer vision** models with **low-rank optimization.**

Algorithms Research Intern | Enable Medicine, Menlo Park, CA Summer 2023

- Applied AI methods on **clinical genomics data**, working towards eventual **drug discovery** and patient outcome models at an **early stage startup**
- Developed **statistical and LLM** based algorithms for analyzing single cell and spatial **transcriptomics and proteomics** data.

Computational Neuroscience Researcher (PhD) | Cold Spring Harbor Laboratory 2019-2024

Computational Neuroscience Research Intern | Cold Spring Harbor Laboratory Summer 2018

- Invented an **unsupervised AI** method to **neuroscience data** to classify **sleep states**.
- Analyzed **time-series and spatiotemporal data** (EEG, LFP, Calcium Imaging) and theory for **probabilistic deep learning** models
- Managed all SQL-based **databases**, group-wide **codebases**, and GPU **servers**
- **Mentored** summer interns and incoming students and organized coding lectures

Software Engineering Practicum Intern | Google, Mountain View, CA Summer 2017

- **Systems software engineering** for deep learning **model evaluation** in C++ & Python
- Contributed to a **production-scale end-to-end** machine learning platform in Tensor Flow Extended (TFX).

Computational Neuroscience Research | Stanford University, Stanford, CA. 2017 - 2019

- Trained and evaluated convolutional neural networks (CNNs) of the retina in Tensorflow and PyTorch

PUBLICATIONS AND PRESENTATIONS

Published in peer-reviewed journals and conference proceedings including NeurIPS workshops, *Neuron*, and *Neural Computation*. Presented talks and posters at top neuroscience and machine learning conferences, such as Society for Neuroscience (SFN), Computational and Systems Neuroscience (COSYNE)

Publication Highlights:

- **Wang. JH**, *et al.* A manifold of heterogeneous brain states across cortical areas (*in prep).*
- **Wang, JH**, e*t al.* Variational autoencoder for learning robust representations of time-series data (*NeurIPS*: *UniReps: the First Workshop on Unifying Representations in Neural Models).*
- Others:
- Shen, Y., **Wang, J**. & Navlakha, S. A correspondence between normalization strategies in artificial and biological neural networks. *Neural Computation (*2021) doi:10.1101/2020.07.17.197640
- Maheswaranathan, N. *et al.* Interpreting the retinal neural code for natural scenes: From computations to neurons. *Neuron* (2023)
- **Wang, J.**, Jennings, A. K. & Kowalski, J. R. The Anaphase-Promoting Complex (APC) ubiquitin ligase affects chemosensory behavior in C. elegans. *PeerJ* **4**, e2013 (2016). doi: 10.7717/peerj.2013

Conference presentations: ”A manifold of heterogeneous brain states across cortical areas”
COSYNE ’22(Poster), Society for Neuroscience ’22 (Poster), EAEEG ’23 (talk), COSYNE ’23 (poster)

LEADERSHIP

Vice President, Diversity Initiative & Advancement for Science | CSHL, *Vice President*

- Organized coffee chats to support underrepresented trainees and create a safe space
- Represented the graduate office and community at HBCU and community college recruitment
- Launched workshops for graduate applications and essays

President, Kids with Dreams | Stanford University

- Led an over 100 person club in planning and managing events for kids with disability, including weekly programs and yearly events such as Winter Formal.
- Liaised with 300+ families in the Bay Area and worked with local nonprofits

TEACHING

Practical Coding Series | CSHL, *Organizer and Lecturer*

Undergraduate Python Course | CSHL, *Organizer and Lecturer*

Introduction to Computing at Stanford | Stanford University, *Lecturer*