

# CHING FANG

ching.fang@columbia.edu | chingf.github.io | [@chingfang17](#) | [LinkedIn](#)

## EDUCATION

---

<b>Columbia University</b> PhD in Neuroscience, at the Theoretical Neuroscience Center Advisors: Larry Abbott, Dmitriy Aronov	Aug 2019-Sept 2024
<b>University of California, Berkeley</b> B.A. in Computer Science, B.A. in Molecular & Cell Biology (Honors)	December 2018

## AWARDS

---

**2019 National Science Foundation Graduate Research Fellow**  
**2018 IL Chaikoff Award** for excellence in U.C. Berkeley's neuroscience program  
**2018 Dean's Honors List** in recognition of academic performance

## RESEARCH EXPERIENCE

---

**Postdoctoral Researcher**  
**w/ Kanaka Rajan | Harvard University** Oct 2024 - present  
Neuro-AI research on the use of episodic memory to support efficient learning.

*Previous Industry Experience*

**Apple | Machine Learning Research Intern** April 2024 - Sep 2024  
Building foundation models for multimodal time series using healthcare data. Internship with the Body-Sensing Intelligence Group

*Previous Academic Experience:*

**Larry Abbott | Columbia Theoretical Neuro. Center** Jan 2020 - present  
PhD student. Topic: biological learning algorithms, predictive coding in deep learning models.

**Dmitriy Aronov | Columbia University** Jan 2020 - present  
PhD student. Topic: reinforcement learning models of neural activity.

**Liam Paninski | Columbia Theoretical Neuro. Center** Aug 2019 - Dec 2019  
PhD rotation student. Topic: probabilistic graphical models to identify latent behavioral states.

**Jose Carmena | UC Berkeley Electrical Engineering** May 2018 - Aug 2019  
Research assistant. Topic: learning in brain-machine interfaces, interpretable ML models.

**Dan Feldman | Helen Wills Neuroscience Institute** Jan 2015 - May 2018  
Research assistant. Topic: building models of neural population tuning in somatosensory cortex.

**Anne Collins | UC Berkeley Cognitive Science** June 2016 - Aug 2016  
Research assistant. Topic: hierarchical reinforcement learning in human decision making.

*Previous Research Collaborators:*

- Kim Stachenfeld (Google DeepMind): changes in representational geometry from auxiliary tasks in deep reinforcement learning.
- Guangyu Robert Yang (MIT): biological learning in transformer neural networks.
- Guillermo Horga (Columbia): convolutional neural network models of speech comprehension.

## JOURNAL & CONFERENCE PAPERS

---

**Fang, C.\***, Lindsey, J.\*, Abbott, L. F., Aronov, D., Chettih, S. [Barcode activity in a recurrent network model of the hippocampus enables efficient memory binding](#). *eLife*, 2024.

**Fang, C.**, Sandino, C., Mahasseni, B., Minxha, J., Pouransari, H., Azemi, E., Moin, A., Zippi, E. [Promoting cross-modal representations to improve multimodal foundation models for physiological signals](#). *NeurIPS Advances in Medical Foundation Models (AIM-FM) Workshop*, 2024.

**Fang, C.**, Stachenfeld, K. [Predictive auxiliary objectives in deep RL mimic learning in the brain](#). *ICLR*, 2024. (Accepted as oral, top 1.2% of submissions)

**Fang, C.**, Aronov, D., Abbott, L. F., Mackevicius, E. [Neural learning rules for generating flexible predictions and computing the successor representation](#). *eLife*, 2023.

**Fang, C.\***, Shook, E.\*, Buck, J.\*, and Horga, G. [Predictive Coding Dynamics Improve Noise Robustness in A Deep Neural Network of the Human Auditory System](#). *NeurIPS Shared Visual Representations in Humans and Machines (SVRHM) Workshop*, 2022. (Accepted as oral)

**Fang, C.**, Aronov, D., Abbott, L., and Mackevicius, E. [Biological Mechanisms for Learning Predictive Models of the World and Generating Flexible Predictions](#). *ICML Beyond Bayes Workshop*, 2022. (Accepted as oral)

Vendrell-Llopis, N., **Fang, C.**, Qu, A., Costa, R., Carmenta, J. [Diverse operant control of different motor cortex populations](#). *Current Biology*, 2022.

Tyulmankov, D.\*, **Fang, C.\***, Vadaparty, A., and Yang, G.R. [Biological key-value memory networks](#). *NeurIPS*, 2021.

(\* equal contribution)

## TALKS

---

**International Conference on Learning Representations (ICLR)**

Main conference; top 1.2% of submissions

*Lisbon, March 2024*

**Computational and Systems Neuroscience (COSYNE)**

Main conference; top 3% of submissions

*Lisbon, March 2024*

**Computational and Systems Neuroscience (COSYNE) Learning rules workshop**

Invited talk

*Lisbon, March 2024*

**DeepMind NeuroLab Workshop**

*London, March 2024*

**Flatiron Institute Junior Theoretical Neuroscientists Workshop**

*NYC, June 2023*

**National Institute of Neurological Disorders and Stroke T32**

*Philadelphia, June 2023*

**DeepMind NeuroLab Workshop**

*London, Feb 2023*

**Max Planck UCL Centre for Computational Psychiatry**

*London, Feb 2023*

**NeurIPS SVRHM Workshop**

*New Orleans, Dec 2022*

**Cognitive Computational Neuroscience (CCN)**

*San Francisco, Aug 2022*

**Flatiron Institute Center for Computational Neuroscience**

*New York, Aug 2022*

**ICML Beyond Bayes Workshop**

*Baltimore, July 2022*

**Gatsby Tri-Center Meeting for Theoretical Neuroscience**

*Jerusalem, June 2022*

## SELECT POSTERS

---

**Fang, C.**, Stachenfeld, K., “Connecting hippocampal representations to predictive auxiliary tasks in deep reinforcement learning”. *Cognitive Computational Neuroscience (CCN)*, 2023.

**Fang, C.**, Shook, E., Buck, J., and Horga, G., “Predictive Coding Dynamics Improve Noise Robustness in A Deep Neural Network of the Human Auditory System”. *Computational and Systems Neuroscience (COSYNE)*, 2023.

Mackevicius, E., **Fang, C.**, Chettih, S., Hale, S., and Aronov, D., “Representations of one-shot and consistent information in the hippocampus of memory-expert birds”. *Society for Neuroscience*, 2022.

Tyulmankov, D., **Fang, C.**, Dong, Ling L., Vadaparty, A., and Yang, G.R., “Biological learning in key-value memory networks”. *Computational and Systems Neuroscience (COSYNE)*, 2022.

Vendrell-Llopis, N., **Fang, C.**, Qu, A., Kitano, M., Costa, R., Carmena, J. “Isolating cell-type specific subpopulations of motor cortex neurons in neuroprosthetic learning”. *Society for Neuroscience*, 2019.

**Fang, C.**, Laboy-Juarez, K., Feldman, D., “Neural Coding of Whisker Timing in Multi-Whisker Sensation.” *California Cognitive Science Conference*, 2018

## TEACHING

---

**TA, *Intro to Theoretical Neuroscience* at Columbia University** Aug 2023 - Dec 2023

**Lecturer, *Math Tools for Neuroscience* at Columbia University** Jan 2022 - May 2023

**TA, *Reinforcement Learning Workshop* at COSYNE conference** March 2023

**TA, *Synthetic Biology* at UC Berkeley** Aug 2018 - Dec 2018

**TA, *Algorithms & Intractable Problems* at UC Berkeley** Aug 2017 - Dec 2017

**TA, *Data Structures* at UC Berkeley** Aug 2016 - Aug 2017

## MENTORING, OUTREACH, & ORGANIZATION

---

- Columbia Access Neuroscience: helped organize predoctoral outreach program to encourage participation of underrepresented students in neuroscience research.
- Zuckerman Institute Gender Inclusion Group: helped organize a seminar series discussing gender inequities in science.
- Leadership Alliance Summer Research Program: mentored undergraduate student.
- Columbia *Scientist on the Subway*: wrote profiles on neuroscientists from diverse backgrounds.
- Zuckerman Institute Climbing Group: founder

## REVIEWS FOR CONFERENCES AND JOURNALS

---

CoSyNe 2025, *Neural Computation*, NeuRIPS Unifying Representations in Neural Models 2024 Workshop,  
Cognitive Computational Neuroscience (CCN) 2022