CHING FANG

ching_fang@hms.harvard.edu | chingf.github.io | @chingfang17 | LinkedIn

EDUCATION

Columbia University Aug 2019-Sept 2024
PhD in Neuroscience, at the Theoretical Neuroscience Center; NSF GRFP 2019
Advisors: Larry Abbott, Dmitriy Aronov

University of California, Berkeley December 2018
B.A. in Computer Science, B.A. in Molecular & Cell Biology (Honors)

RESEARCH EXPERIENCE

Research Fellow | Cambridge-Boston Alignment Initiative June 2024-present

Testing mechanistic interpretability techniques in LLMs finetuned to use encoded reasoning. Work with Samuel Marks.

Postdoctoral Researcher | Kempner Institute at Harvard University Oct 2024 - June 2024

Studying mechanisms of in-context reinforcement learning in transformers. Work with Kanaka Rajan.

Machine Learning Research Intern | Apple April 2024 - Sep 2024

Building foundation models for multimodal time series of healthcare data.

PhD Researcher | Columbia Theoretical Neuro. Center Aug 2019 - Sep 2024

Topics: transformer-like models of memory in the brain; deep RL models to simulate representation learning in the brain. Work advised by Kim Stachenfeld, Larry Abbott, Dmitriy Aronov.

Research Assistant | UC Berkeley Electrical Engineering May 2018 - Aug 2019

Brain-machine interfaces, interpretable ML models. Work advised by Jose Carmena.

CONFERENCE PAPERS AND PREPRINTS

Fang, C., Rajan, K. From Memories to Maps: Mechanisms of In-Context Reinforcement Learning in Transformers. *arXiv preprint*, 2025.

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., 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.*, 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)

Tyulmankov, D.*, **Fang, C.***, Vadaparty, A., and Yang, G.R. Biological key-value memory networks. *NeurIPS*, 2021.

JOURNAL 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*, 2025.

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

Vendrell-Llopis, N., **Fang, C.**, Qu, A., Costa, R., Carmena, J. Diverse operant control of different motor cortex populations. *Current Biology*, 2022. (* equal contribution)

TALKS

Yale NeuroAI Journal Club New Haven, March 2025

International Conference on Learning Representations (ICLR)
Main conference; top 1.2% of submissions *Vienna, May 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*

SKILLS

Python, PyTorch, Slurm, Git