CHING FANG

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EDUCATION

Columbia University Aug 2019-present
PhD candidate in Neurobiology & Behavior
Advisors: Larry Abbott, Dmitriy Aronov

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

AWARDS

2019 National Science Foundation Graduate Research Fellow

2018 IL Chaikoff Award for excellence in U.C. Berkeley's neuroscience program

2018 Best presentation award at Molecular & Cell Biology undergraduate symposium

2018 Dean's Honors List in recognition of academic performance

PUBLICATIONS & CONFERENCE POSTERS

Tyulmankov, D.*, **Fang, C.***, Vadaparty, A., and Yang, G.R. (Accepted to *NeurIPS 2021*). Biological key-value memory networks. (* equal contribution).

Vendrell-Llopis, N., **Fang, C.**, Qu, A., Costa, R., Carmena, J. (journal submission in prep). Improved neural control of pyramidal-tract neurons over intra-telencephalic neurons in operant learning

Vendrell-Llopis, N., **Fang, C.**, Qu, A., Kitano, M., Costa, R., Carmena, J. Isolating cell-type specific subpopulations of motor cortex neurons during neuroprosthetic learning. In 48th Meeting of the Society for Neuroscience (SfN), 2019.

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

RESEARCH EXPERIENCE

Abbott/Aronov Lab | Columbia Theoretical Neuro. Center Aug 2019 - present

· Combining reinforcement learning models and recurrent neural networks to model memory formation and retrieval.
· Analyzing and modeling neural data from the hippocampus of food-caching birds.

Yang Lab | MIT Brain & Cognitive Sciences Jan 2021 - present

· Developing neurally-plausible learning rules to implement the key-value storage and attention mechanisms used in transformer neural networks.
· Relating tranformer neural networks to models of long-term memory and hippocampal representations.

Paninski Lab | Columbia Theoretical Neuro. Center Aug 2019 - Dec 2019

· Rotation project using probabilistic graphical models to find latent states of behavior and decision making in mice performing a two-action forced choice task.

Carmena Lab | Berkeley EECS Department May 2018 - Aug 2019

· Used brain-machine interfaces (BMI) to investigate neuroprosthetic learning in motor cortex.
· Used Shapley values to interpret our machine learning models and understand how intrinsic properties of neurons affected how well these neurons could be used in BMI control.

Feldman Lab | Helen Wills Neuroscience Institute Jan 2015 - May 2018

· Developed computational models of neurons in somatosensory cortex as a population of negative binomial processes modulated by sensory input timing.

Collins Lab | Berkeley Cognitive Science Department June 2016 - Aug 2016

· Developed a behavioral application to test reinforcement learning models of human decision making.

TEACHING ASSISTANTSHIPS

BioE 147/247: Synthetic Biology, UC Berkeley Aug 2018 - Dec 2018

· Helped manage a hybrid online/in-person class between UC Berkeley and MIT.
· Topics: metabolic engineering, genome engineering, protein and RNA circuits, gene drives

CS 170: Algorithms & Intractable Problems, UC Berkeley Aug 2017 - Dec 2017

· Developed new course project for a class of 700+ students.
· Led discussion sessions for 60+ students.
· Topics: asymptotics, graph theory, linear and dynamic programming, approximation algorithms

CS 61B: Data Structures, UC Berkeley Aug 2016 - Aug 2017

· Developed course materials and tests
· Helped manage course logistics for a class of 300+ students, and ran discussion sessions.
· Topics: Java programming, data search structures, graph algorithms, etc.

MENTORING & OUTREACH

Columbia Access Neuroscience Aug 2020 - present

· Helped organize diversity initiatives for underrepresented minorities on the undergraduate level
· Received a department internal award for service in diversity, equity, and inclusion

Zuckerman Institute Gender Inclusion (ZIGI) Group June 2021 - present

· Helped organize a seminar series on topics related to gender inclusivity in science

Leadership Alliance Mentor June 2021 - Aug 2021

· Mentored an undergraduate student on a summer research project.

Scientist on the Subway Aug 2020 - Dec 2020

· Writer and editor of profile articles about the diverse stories of neuroscientists for non-science audiences.

SKILLS

Languages (In order of comfort): Python, Java, Matlab
Miscellaneous: Pytorch, Linux, Git, Arduino, Slurm, Jupyter, Matplotlib