MICHELE WINTER, Ph.D

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EDUCATION

University of California, Berkeley, Berkeley, CA August 2018 - May 2024
Ph.D., Vision Science
Selected Courses: Signals and Systems, Neural Computation
Awards: Society for Neuroscience Trainee Professional Development Award, National Eye Institute Early Career Scientist Travel Award, Elsevier/Vision Research Travel Award, NSF GRFP Honorable Mention, 4th Place in UW Neural Data Challenge

Brown University, Providence, RI Sept 2014 - May 2018
Sc.B., Computational Neuroscience
Honors Thesis: Comparative Analysis of CNNs and DoG Filters to Model Mouse Visual Cortex
Awards: QuestBridge Finalist, Champlin Foundations Scholarship, Link/SEW Summer Research Award

TECHNICAL SKILLS

- Programming Languages & Libraries: PyTorch, Theano, Keras, Tensorflow, Psytoolkit, Python, MATLAB
- Statistical Methods: Dimensionality reduction, regression methods, neural networks
- Areas of Expertise: Visual neuroscience, machine learning, large-scale systems and compute infrastructure, large-scale data management, scalable GPU compute

RESEARCH EXPERIENCE

Gallant Lab, *Graduate Researcher*, UC Berkeley Jan 2019 - May 2024
Advisor: Dr. Jack L. Gallant
Topic: Investigating intermediate visual neuron receptive field properties using a biologically plausible neural network architecture.
- Fit over 300 end-to-end trained biologically inspired neural network and over 300 task-based CNN transfer-learning models to electrophysiology data from visual area V4 neurons.
- Treated these models as in silicon neurons to investigate how V4 neurons are selective for space, color, and time.
- Organized, processed, and manage a large (~10 TB) data set and built a custom job manager for training hundreds of neural network models on GPU in parallel.
- Maintain our lab's compute infrastructure. To do this, I have gained familiarity with managing drivers, Ceph, Nvidia Docker, and custom VPN setups.
- Created a set of Colab notebooks covering PCA and reverse correlation for use in mentoring a rotating graduate student in computational neuroscience skills.

Yu Lab, *Rotating Graduate Researcher,* UC Berkeley Aug 2018 - Dec 2018
Advisor: Dr. Stella Yu
Topic: Data-driven analysis of mid-level perceptual cues for figure-ground segmentation with unsupervised learning.
- Utilized features from an unsupervised learning algorithm previously released by the lab, to determine if mid-level perceptual cues for figure-ground segmentation that arise directly are different from the canonical Gestalt cues of convex curves and T-junctions.

Serre Lab, *Undergraduate Researcher,* Brown University Dec 2015 - May 2018
Advisor: Dr. Thomas Serre
Topic: Neural network model prediction performance on mouse calcium imaging data in response to natural stimuli.
- Compared the efficacy of different neural network models on predicting neuron activity from mouse calcium imaging to natural stimuli.
- Responsibilities included writing code in Python and working with neural network models in Tensorflow.

Computational Perception & Cognition Lab, *Undergraduate Researcher*, CSAIL/MIT Summer 2016 & 2017
Advisor: Dr. Aude Oliva
Topic: A large, naturalistic, auditory dataset for investigating semantic representations in cortex with fMRI and MEG.
- Created an auditory dataset encompassing animate/inanimate and object/large space sounds from animal, human, object, and scene categories. Wrote and conducted a pilot fMRI experiment in Matlab that utilizes this dataset. Additionally, streamlined the Matlab pipeline for fMRI data analysis in BrainVoyager.
- Responsibilities included writing code in Python and Matlab and coding experiments in Psytoolkit.

CONFERENCE PRESENTATIONS

- **Winter, M.**, la Tour, T. D., Eickenberg, M., Oliver, M., & Gallant, J. (2023). The hierarchical convolutional energy model: a biologically plausible model that explains spatial, chromatic, and temporal tuning in V4 neurons. *Society for Neuroscience*.
- **Winter, M.**, la Tour, T. D., Eickenberg, M., Oliver, M., & Gallant, J. (2022). Long-term recordings from area V4 neurons and an accurately-predicting deep convolutional energy model reveal spatial, chromatic and temporal tuning properties under naturalistic conditions. *Journal of Vision*, *22*(14), 4363-4363.
- **Winter, M.**, Eickenberg, M., Oliver, M., & Gallant, J. L. (2020). Comparison of generic convolutional networks versus biologically inspired networks as models of V4 neurons. *Journal of Vision*, *20*(11), 461-461.

TEACHING EXPERIENCE

Visual Perception Sensitivity, *Graduate Student Instructor (GSI),* Berkeley, CA — Fall 2018 & 2019

Pre-Collegiate Summer Program in Perception & Vision Science, *GSI,* Berkeley, CA — July - Aug 2019

Computational Vision, *Undergraduate Teaching Assistant*, Providence, RI — Fall 2016

LEADERSHIP EXPERIENCE

Vision Science Graduate Student Government, *President,* Berkeley, CA — Nov 2020 - Nov 2021

- Represented student interests in faculty meetings, planned admissions and candidate interview events.
- Served as a member of the Vision Science admissions committee and the Berkeley Optometry DEIB Council.
- Facilitated funding for and organized social events to raise graduate student moral in the midst of the pandemic.
- Collaborated in the organization of a summer research program for undergraduates interested in Vision Science research.

Vision Science Graduate Student Government, *Vice President of Finance,* Berkeley, CA — Nov 2019 - Nov 2020

- Coordinated with the President,VP of Administration,Vision Science faculty and administration to organize social events for Vision Science students and represent students voices in student initiatives.
- Collaborated with the President and VP of Admin to add a student government constitution addendum for the Vision Science Diversity, Equity, Inclusion and Belonging (DEIB) Committee. Then organized the election of the first VS DEIB Committee.
- Worked with the VS DEI&B Committee to source funding and administrative support for their initiatives.

Bay Area Vision Research Day (BAVRD) Conference, *Lead Organizer*, Berkeley, CA — Sept 2018 - Sept 2019

- Led my graduate student class in organizing the BAVRD conference, a free conference dedicated to sharing cutting-edge research in Vision Science, Visual Psychophysics, Computer Vision, Biology, and Neuroscience, with ~200 people in attendance.
- Fundraised over $6k in grants and donations from industry donors and departmental organizations.

OTHER EXPERIENCE

QuestBridge Alumni Mentorship, *Mentor,* Virtual — Jan 2023 - Aug 2023

- Meet monthly with a mentee in the QuestBridge program, offering guidance on career and finance decisions post graduation with a particular focus on the first-gen/low-income student experience.

Be A Scientist, *Volunteer Scientist,* Berkeley, CA — Spring 2019

- Met weekly with students at King Middle School for 6 weeks and guided them in completing basic science projects.

Breakthrough Lab Accelerator, *B-Lab Fellow,* Providence, RI — June 2018 - Aug 2018

- Chosen as a B-Lab Fellow at Brown University's startup accelerator to work on Formally, an intuitive form-filler to aid in completing immigration applications.
- Worked on design, logical question flow, writing and reviewing code in Javascript, and fundraising with my teammates.