

# MICHELE WINTER

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## EDUCATION

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**University of California, Berkeley**, Berkeley, CA

August 2018 - Present

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

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

## TECHNICAL SKILLS

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

## RESEARCH EXPERIENCE

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**Gallant Lab**, *Graduate Researcher*, UC Berkeley

Jan 2019 - Present

*Advisor:* Dr. Jack L. Gallant

*Topic:* Investigating intermediate visual neuron receptive field properties using a biologically plausible neural network architecture.

- I am currently using a biologically inspired neural network to probe how neurons in the middle of the visual processing pathway represent visual stimuli.
- 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.

## SELECTED PUBLICATIONS AND PRESENTATIONS

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- **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

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**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

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**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

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**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.