

Eleanor Batty | Curriculum Vitae

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Education

- **Columbia University** 2014–Present
Ph.D. Candidate, Neurobiology & Behavior
- **Brown University** 2010–2014
B.Sc. with Honors in Neuroscience, B.A. in Physics, GPA 4.0

Research Experience

- **Ph.D. Research** 2015–Present
Advisor: Liam Paninski, Center for Theoretical Neuroscience, Columbia University
Research focuses at the intersection of machine learning and neuroscience, specific projects include developing artificial neural network based methods for improved encoding and decoding of neural responses
- **Undergraduate Thesis Research** 2013–2014
Advisor: Elie Bienenstock, Applied Mathematics Department, Brown University
Incorporated graph-theory concepts into hierarchical models of vision to improve performance
- **Undergraduate Research** 2011–2014
Advisor: Jerome Sanes, Neuroscience Department, Brown University
Collected and analyzed fMRI data to study the effects of gaze on directional coding in human fronto-parietal cortex
- **EPFL Summer Research Program** Summer 2013
Advisor: Wulfram Gerstner, Laboratory for Computational Neuroscience, EPFL
Implemented and analyzed a novel neuron model which incorporated spike-frequency adaptation into an exponential integrate-and-fire model
- **CSHL Undergraduate Research Program** Summer 2012
Advisor: Anne Churchland, Cold Spring Harbor Laboratory
Recorded and analyzed electrophysiological data from rats to investigate the encoding of head movement in posterior parietal cortex

Teaching Experience

- **Lecturer** Fall 2016, 2017
Quantitative Approaches for Experimental Neuroscientists
Graduate-level course, lectured about GLMs and deep neural networks, designed and graded homework
- **Teaching Assistant** Spring 2017, 2019
Introduction to Theoretical Neuroscience
Graduate-level course, taught recitations and led homework help sessions
- **Teaching Assistant** Fall 2016
Experimental Approaches
Graduate-level course, edited and discussed grant proposals
- **Teaching Assistant** Fall 2015
Statistical Analysis of Neural Data
Graduate-level course, gave two neuroscience review lectures

Teaching Assistant

Introduction to Neuroscience

Undergraduate-level course, lectured weekly

Work Experience

Facebook AI Research Internship

Summer 2019

Advisor: Ari Morcos

Publications

- **Batty, E.***, Whiteway, M.*, Saxena, S., Biderman, D., Abe, T., Musall, S., Gillis, W., Markowitz, J., Churchland, A., Cunningham, J., Datta, S., Linderman, S., Paninski, L. BehaveNet: nonlinear embedding and Bayesian neural decoding of behavioral videos. Advances in Neural Information Processing Systems 2019. * Authors contributed equally.
- Parthasarathy, N.*, **Batty, E.***, Falcon, W., Rutten, T., Rajpal, M., Chichilnisky, E., Paninski, L. Neural Networks for Efficient Bayesian Decoding of Natural Images from Retinal Neurons. Advances in Neural Information Processing Systems (NeurIPS) 2017. Accepted as a spotlight presentation. * Authors contributed equally.
- Lee, J., Carlson, D., Shokri, H., Yao, W., Goetz, G., Hagen, E., **Batty, E.**, Chichilnisky, E., Einevoll, G., Paninski, L. YASS: Yet Another Spike Sorter. Advances in Neural Information Processing Systems (NeurIPS) 2017.
- **Batty, E.**, Merel, J., Brackbill, N., Heitman, A., Sher, A., Litke, A., Chichilnisky, E., Paninski, L. Multilayer recurrent network models of primate retinal ganglion cell responses. International Conference on Learning Representations (ICLR) 2017.

Conference Talks

- "Encoding and Decoding Retinal Responses Using Artificial Neural Networks." Gatsby Tri-Center Meeting. 2018.
- "Neural Networks for Efficient Bayesian Decoding of Natural Images from Retinal Neurons." Annual Conference on Cognitive Computational Neuroscience. 2017.

Posters

- **Batty, E.***, Whiteway, M.*, et al (2019). BehaveNet: nonlinear embedding and Bayesian neural decoding of behavioral videos. Society for Neuroscience.
- Parthasarathy, N.*, **Batty, E.***, et al (2017). Nonlinear amortized Bayesian decoding of natural scenes from retinal responses. Collaborative Research in Computational Neuroscience (CRCNS) Annual PI Meeting.
- **Batty, E.** et al (2016). Multilayer recurrent network models of primate retinal ganglion cells. NIPS Workshop, Brains and Bits: Neuroscience meets Machine Learning.
- Brackbill, N., Heitman, A., **Batty, E.** et al (2016). Spatial extent of inputs to primate ganglion cells in natural viewing conditions. FASEB.

Awards, Honors, & Fellowships

- Google PhD Fellowship 2018-Present
- National Science Foundation Graduate Research Fellowship 2015-2018
- James T. McIlwain Award for Excellence in Undergraduate Research 2014
- BIO REU Travel Scholarship 2013

Skills

Advanced: Python, Matlab, Theano, PyTorch

Intermediate: TensorFlow