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 data from electrophysiological recordings in 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*
  Introduction to Theoretical Neuroscience
  Graduate-level course, 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** *Fall 2013*
  Introduction to Neuroscience

  Undergraduate-level course, lectured weekly

Publications

- 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 (NIPS) 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 (NIPS) 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. June 2018.
- "Neural Networks for Efficient Bayesian Decoding of Natural Images from Retinal Neurons." Annual Conference on Cognitive Computational Neuroscience. September 2017.

Posters

- 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