billbrod@gmail.com
http://billbrod.gitlab.io
William Broderick
@wfbroderick
billbrod

William F. Broderick

Education

2016 – present **Ph.D.**, *New York University*, New York, NY.
Center for Neural Science

2009–2013 **B.A.**, *Oberlin College*, Oberlin, OH, *GPA: 3.94*.
Majors: Neuroscience, Mathematics; Minor: Computer Science

Spring 2012 **Budapest Semester in Mathematics**, Budapest, Hungary, *GPA: 4.07*.
High Honors

Research Experience

2016 – present **Ph.D. Student**, *New York University Center for Neural Science*, New York, NY.
Prof. Eero Simoncelli, Ph.D. and Prof. Jonathan Winawer, Ph.D.
- Collected data on the spatial frequency preferences of voxels in the human visual cortex
- Built computational models to predict the BOLD signal in the early visual cortex.

2014 – 2016 **Research Assistant**, *Duke University Center for Cognitive Neuroscience*, Durham, NC.
Prof. Scott Huettel, Ph.D. and Prof. Guillermo Sapiro, Ph.D.
- Created a pre-processing pipeline for fMRI data in Python, making lab methods simpler and more user-friendly
- Performed multi-variate pattern analysis (MVPA) on fMRI data in a social, competitive game in order to investigate the neural correlates of social decision making and deception (Python)
- Analyzed behavioral data of participant behavior in a social, competitive game, making use of k-means clustering and principal components analysis (PCA) to define a trial-wise metric of strategic behavior for use in MVPA regression
- Collected behavioral and functional imaging data from adult and adolescent participants in a study to investigate the effects of social signals and peer influence on risk-taking and reward processing
- Supervised undergraduate research assistants for the collection of the above data

2013–2014 **Luce Scholar**, *South China Normal University School of Psychology*, Guangzhou, China.

Prof. Wang Suiping, Ph.D.

- *Selected by the Luce Scholars Program, a nationally competitive fellowship program launched by the Henry Luce Foundation in 1974 to enhance the understanding of Asia among potential leaders in American society. The program selects 18 scholars annually and arranges individualized language training and professional placement for one year*
- Managed two independent research projects as a full-time visiting scholar
- Extended a computational model of numerosity using deep learning in an artificial neural network (MATLAB/Octave). Modified earlier study's code to allow for training on different tasks to compare the encoding strategy employed by the network
- Analyzed fMRI data comparing the network properties of human brain functional networks during bilingual readings. Preprocessed and analyzed data in MATLAB, using original code, DPARSF, and functions from Gretna and Brain Connectivity Toolboxes

2011–2013 **Undergraduate Research Assistant**, *Oberlin College Neuroscience Department*, Oberlin, OH.

Prof. Patrick Simen, Ph.D.

- Enhanced previously-developed model explaining reaction time in a two-alternative forced choice task in response to varying response-stimulus intervals and probability of the two choices (MATLAB)
- Updated model code in MATLAB to explain recently-gathered experimental data with model

Skills

Programming languages	Python, MATLAB, R, Java
fMRI analysis	Pre-processing, Graph theoretical analysis, Multi-variate pattern analysis, Permutation testing, Forward models
Python	Nipype, Nibabel, PyMVPA, Pandas, NumPy, SciPy, Scikit-learn, Seaborn, Matplotlib
Misc. skills	Computational modeling, Data analysis pipelines

Languages

Mandarin	Highly Proficient	French	Proficient
Cantonese	Basic	Hungarian	Rudimentary

Awards and Scholarships

2016	NSF Graduate Research Fellow	*National Science Foundation*
2013 – 2014	Luce Scholar	*Henry Luce Foundation*
2013	Phi Beta Kappa	*Phi Beta Kappa Society*
2012	Nu Rho Psi	*National Honor Society in Neuroscience*
2009 – 2013	John N. Stern Merit Scholarship in the Natural Sciences	*Oberlin College*
2009	National Merit Scholar	*National Merit Scholarship Program*

Presentations

Benson, Noah C. et al. *An anatomically-defined template of BOLD response in V1-V3*. St Pete Beach, FL: Vision Sciences Society, May 2017.

Benson, Noah C. et al. *Towards a standard cortical observer model in human V1-V3*. San Diego, CA: Society for Neuroscience, Nov. 2016.

Broderick, W. F. et al. *A multi-variate pattern analysis investigation of strategic thinking and deception in a dynamic, competitive game*. Chicago, IL: Society for Neuroscience, Oct. 2015.