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Matthew Whiteway

EDUCATION	University of Maryland , College Park, MD Ph.D. in Applied Mathematics and Scientific Computing Dissertation: <i>A latent variable modeling framework for analyzing neural population activity</i> Advisor: Dr. Daniel A Butts	2012-2018
	University of Oklahoma , Norman, OK B.Sc. in Physics, B.A. in Mathematics	2006-2011
RESEARCH POSITIONS	Columbia University , New York, NY Postdoctoral Research Scientist Zuckerman Mind Brain Behavior Institute Advisor: Dr. Liam Paninski	2018-current
	University of Maryland , College Park, MD Graduate research in computational neuroscience Advisor: Dr. Daniel Butts	2014-2018
	University of Maryland , College Park, MD Undergraduate research in network science Advisors: Drs. Michelle Girvan and Ed Ott	2010
HONORS AND AWARDS	Center for Comparative and Evolutionary Biology of Hearing Trainee Grant	2015-2016
	Excellence in Teaching Award University of Maryland Department of Mathematics	2013
	J. Clarence Karcher Scholarship University of Oklahoma Department of Physics and Astronomy	2009-2011
	National Merit Scholarship	2006-2011
PUBLICATIONS	Whiteway MR , Bartolo R, Averbeck BB and Butts DA (<i>in prep</i>). Decoding neural population activity within a latent variable framework.	
	Socha K, Whiteway MR , Butts DA and Bonin V (<i>submitted</i>). Behavioral response to visual motion impacts population coding in the mouse visual thalamus.	
	Whiteway MR and Butts DA (<i>submitted</i>). A search for simplicity in neural population activity.	
	Whiteway MR , Socha K, Bonin V and Butts DA (2019). Characterizing the nonlinear structure of shared variability in cortical neuron populations using latent variable models. <i>Neurons, Behavior, Data analysis, and Theory</i> , 2(2).	

Liu J, **Whiteway MR**, Sheikhattar A, Butts DA, Babadi B and Kanold PO (2019). Parallel processing of sound dynamics across mouse auditory cortex via spatially patterned thalamic inputs and distinct areal intracortical circuits. *Cell Reports*, 27(3), 872-885.

Whiteway MR and Butts DA (2017). Revealing unobserved factors underlying cortical activity using a rectified latent variable model applied to neural population recordings. *Journal of Neurophysiology*, 117(3), 919-936.

Stout J, **Whiteway M**, Ott E, Girvan M and Antonsen TM (2011). Local synchronization in complex networks of coupled oscillators. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 21(2), 025109.

CONFERENCE
ABSTRACTS

Batty E, **Whiteway MR**, Saxena S, Biderman B, Abe T, Musall S, Gillis W, Markowitz JE, Churchland AK, Datta SR, Linderman S and Paninski L (submitted). BehaveNet: behavioral video embedding and neural analysis toolbox. *Society for Neuroscience, Chicago, IL*, October 2019.

Glaser J, Linderman S, **Whiteway MR**, Perich M, Dekleva B, Miller L, Paninski L and Cunningham J. State space models for multiple interacting neural populations. *Computational and Systems Neuroscience, Lisbon, Portugal*, March 2019.

Butts DA, Bartsch F, **Whiteway MR** and Cumming BG. Characterizing hierarchical computation within V1. *Society for Neuroscience, San Diego, CA*, November 2018.

Whiteway MR, Bartolo R, Averbeck BB and Butts DA. Decoding neural population activity within a latent variable framework. *Computational and Systems Neuroscience, Denver, CO*, March 2018.

Whiteway MR, Bartolo R, Averbeck BB and Butts DA. Unsupervised nonlinear dimensionality reduction of large-scale neural recordings in prefrontal cortex. *Society for Neuroscience, Washington, D.C.*, November 2017.

Liu J, **Whiteway MR**, Butts DA and Kanold PO. Differential organization of the mouse auditory cortex to tone onset and offset revealed using automated image segmentation. *Society for Neuroscience, Washington, D.C.*, November 2017.

Whiteway MR, Socha K, Bonin V and Butts DA. Nonlinear latent variable approaches for understanding population activity in sensory cortex. *Computational and Systems Neuroscience, Salt Lake City, UT*, February 2017.

Butts DA, Perrin GE, Cui Y, **Whiteway MR**, Demb J and Singer J. Characterizing nonlinear neuronal computation within a single stage of processing. *Computational and Systems Neuroscience, Salt Lake City, UT*, February 2017.

Whiteway MR and Butts DA. Hidden sources of variability modulate populations of sensory neurons. *Society for Neuroscience, San Diego, CA*, November 2016.

Stout J, **Whiteway M**, Ott E, Girvan M and Antonsen TM. The effect of network structure on the path to synchronization in large systems of coupled oscillators. *SIAM Conference on Applications of Dynamical Systems, Snowbird, UT*, May 2011.

TEACHING
EXPERIENCE

Advanced Topics in Theoretical Neuroscience , Columbia University	Spring 2019
Guest Lecturer - Static Dimensionality Reduction Methods	
Introductory Statistics , University of Maryland	Spring 2015
Teaching Assistant	

Multivariable Calculus , University of Maryland Teaching Assistant	Fall 2014
Integral Calculus , University of Maryland Lecturer	Summer 2014
Multivariable Calculus , University of Maryland Teaching Assistant	Spring 2014
Linear Algebra , University of Maryland Teaching Assistant	Fall 2013
Introductory Statistics , University of Maryland Lecturer	Spring 2013
Integral Calculus , University of Maryland Teaching Assistant	Fall 2012

MENTORING	Deep Generative Models for Understanding Natural Images	Spring 2017
	Semester project with an undergraduate student that focused on understanding and implementing variational autoencoders and generative adversarial networks, including their conditional and convolutional variants.	
	An Introduction to Neural Networks for Image Classification	Fall 2016
	Semester project with an undergraduate student that focused on the foundations of neural networks and their application to the problem of image classification.	
	Theory and Applications of the Generalized Linear Model	Summer 2015
	Summer project with an undergraduate student that focused on the theoretical foundations of the generalized linear model, including linear regression, exponential families, maximum likelihood estimation, and iteratively reweighted least squares.	
	Linear Programming and its Applications to Economics	Spring 2015
	Semester project with an undergraduate student that focused on how to represent a linear optimization problem in the language of linear algebra, and the fundamentals of the Simplex Algorithm.	

LANGUAGE SKILLS	Proficient: Python (Tensorflow, OpenCV), MATLAB, \LaTeX
	Inefficient: C++ (OpenGL), Java