Michael J. Seay

1527 Ridge Ave #2C • Philadelphia, PA 19130 • (504) 319 5224

mikejseay@gmail.com   LinkedIn   Online Portfolio   GitHub

EDUCATION

University of California, Los Angeles – Los Angeles, CA

Ph.D in Psychology (work focused on Computational Neuroscience)   *May 2022*
Relevant Coursework: Data Analysis Methods, Advanced Psychological Statistics,
                    Statistical Methods for Time-Series, Spatial Statistics

Tulane University – New Orleans, LA

M.S. in Neuroscience   *May 2013*
B.S. in Neuroscience, *magna cum laude*   *May 2012*
Minor in Psychology, Minor in Mathematics, Coordinate Major in Cognitive Studies
Relevant Coursework: Music & Digital Signal Processing, Linear Algebra, Combinatorics,
                    Scientific Computing, Psychological Statistics, Cognitive Neuroscience

---

EXPERIENCE

Buonomano Lab at UCLA – Graduate Student Researcher
August 2017 – August 2022   *Los Angeles, CA*
- Completed Ph.D focusing on Computational Neuroscience in May of 2022
- Designed and implemented multiple computational models explaining neural functions
- Published two first-author scientific articles, co-author on three forthcoming articles
- Handled large datasets, performed complex statistics and machine learning
- Mentored four undergraduate research volunteers, assisted teaching six courses

Henri Begleiter Neurodynamics Laboratory – Research Scientist
June 2015 – July 2017   *Brooklyn, NY*
- Co-created database system for storing, updating, and accessing 200k+ records containing complex and diverse scientific research information using Python and MongoDB
- Wrote module for analysis, visualization, and statistics of electroencephalogram (EEG) results in Python
- Designed and implemented comprehensive processing pipeline for EEG data using MATLAB
- Devised novel algorithm for calculating Family History Density of an illness from tabular pedigree data, which provided better predictor of alcoholism risk than previous comparable measures
- Supported lab goals, publications, and presentations with analyses, visualizations, and written results

Tulane Cognitive Neuroscience Laboratory – Student and Research Assistant
December 2010 – May 2015   *New Orleans, LA*
- Designed and implemented novel processing pipeline for EEG data
- Co-authored scientific article, contributing novel EEG analyses, visualizations, and writing
- Designed and executed original experiment, publishing results in honors thesis
- Assisted teaching of two courses, mentored undergraduates

SKILLS

Computer programming and literacy:

- Python (`numpy, matplotlib, pandas, scipy, scikit-learn, networkx, torch`)
- R (`tidyverse, caret`, linear modeling tools)
- SQL (Postgres)
- Unix-like OSs
- Git

Analytical techniques

- Psychophysics
- Time-series analysis
- Spectral analysis
- Dimensionality reduction
- Graph theory
- Network modeling

Software:

- Tableau
- RStudio
- Adobe Illustrator
- JetBrains IDEs
- Microsoft Office Suite
- SPSS / JASP

PUBLICATIONS & PRESENTATIONS

Published

Seay MJ, Natan RG, Geffen MN, Buonomano DV (2020). Differential Short-Term Plasticity of PV and SST Neurons Accounts for Adaptation and Facilitation of Cortical Neurons to Auditory Tones. *Journal of Neuroscience.*

Motanis H*, **Seay MJ***, Buonomano DV (2018). Short-Term Synaptic Plasticity as a Mechanism for Sensory Timing. *Trends in Neurosciences.* *contributed equally

Mock JR, **Seay MJ**, Charney DR, Holmes JL, Golob EJ (2015). Rapid cortical dynamics associated with auditory spatial attention gradients. *Frontiers in Neuroscience.*

Unpublished and theses

Zhou S*, **Seay MJ***, Taxidis J, Golshani P, Buonomano DV (under review). Multiplexing working memory and timing: encoding retrospective and prospective information in neural trajectories. *Neuron.*

Soldado-Magraner S, **Seay MJ**, Laje R, Buonomano DV (under review). Orchestrated Excitatory and Inhibitory Learning Rules Lead to the Unsupervised Emergence of Up-states and Balanced Network Dynamics. *Proceedings of the National Academy of Sciences.*

Liu B, **Seay MJ**, Buonomano DV (under review). Creation of neuronal ensembles and cell-specific homeostatic plasticity through chronic sparse optogenetic stimulation. *Journal of Neuroscience.*

Seay MJ (2022). Mechanisms of timing, temporal context, and working memory. *Ph.D thesis.*

Seay MJ (2012). The effect of encoded stimulus strength on auditory cortical responses during short-term memory retrieval of pitch. *Honor's Thesis.*

Presentations

Seay MJ, Natan RG, Geffen MN, Buonomano DV (2019). A cortical spiking model with differential short-term plasticity onto parvalbumin and somatostatin interneurons reproduces *in vivo* results of sensory adaptation in auditory cortex. *Society for Neuroscience.* Chicago, IL.

Seay MJ, Yang RG (2019). Is Dale's Law computationally beneficial? *Computational and Cognitive Neuroscience Summer School.* Suzhou, China.

Seay MJ., Mock JR., Golob EJ (2014). Cortical representations of absolute and relative sound locations during an auditory spatial attention task. *Society for Neuroscience.* Washington, D.C.

REFERENCES

Excellent references can be provided upon request by:

Bernice Porjesz
Professor, Psychiatry and Behavioral Sciences, SUNY Downstate Medical Center
Director, Henri Begleiter Neurodynamics Laboratory
bernice.porjesz@downstate.edu
(718) 270-2911

Dean Buonomano
Professor, Department of Neurobiology, UCLA
dbuono@ucla.edu
(310) 794-5009

Ed Golob
Professor, Department of Psychology, University of Texas at San Antonio
edward.golob@utsa.edu
(210) 458-8055