

Brian Barry

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Education

University of California, San Diego

March 2020

BS: Cognitive Science (Machine Learning and Neural Computation)
Minor: Mathematics

Research Experience & Internships

Undergraduate Research Assistant

Voytek Lab, UC San Diego

September 2019 - present: Assessing the correlation between spatial and temporal decompositions of neural spiking data using Python. (PI: Dr. Bradley Voytek)

- Built pipeline to compute correlations between spectral exponents of eigenvalue spectra (from PCA) and power spectra (from FFT)
- Implemented computational model to simulate data
- Presented findings at two conferences

Undergraduate Research Assistant

Swartz Center for Computational Neuroscience, UC San Diego

May 2019 - present: Analyzing EEG data from a rhythmic control task, by applying a data cleaning and clustering pipeline using EEGLAB and MATLAB. (PI: Dr. John Iversen)

- Writing scripts to automate ICA decomposition, epoching, fitting dipoles, and plotting figures
- Organizing ERP, dipole and ERSP component clusters with interactive HTML visualization
- Computing statistical significance of component clusters

Undergraduate Research Assistant

UC San Diego Health

January - June 2019: Conducted EEG neurofeedback experiments and pupillometry assessments on schizophrenic and schizoaffective subjects. (PI: Dr. Fiza Singh)

Research Assistant

Coastal Marine Biolabs, Ventura, CA

August 2015: Worked with a team of students to visualize neural populations in the developing spinal cord of chick embryos using transgenic techniques and fluorescence microscopy.

Intern

Jet Propulsion Laboratory, Pasadena, CA

June - August 2014: Organized and compiled Voyager I residual radio data from Unix into Excel.

Conferences

Barry, B., Voytek, B., Gao, R. (2020). Relating the power law decay of power and eigenvalue spectra of neural population data. *Neuromatch Conference* (talk), *Brain Criticality Conference* (poster).

Teaching Experience

Instructional Assistant

Cognitive Science, UC San Diego

January - March 2020: Led discussion and graded assignments for COGS 101A (Sensation and Perception). (Lecturer: Dr. Joshua Davis)

Projects and Extracurricular Activities

Founder

Major Map Initiative, UC San Diego

January - August 2020: Led the development of majormap.ucsd.edu, a web based student organization intended to help students select and understand their majors with greater depth. The website currently has an interactive applet that displays course prerequisite maps with D3.js, with more features under development.

- Implemented web scraping script in Python to collect course prerequisites
- Designed front end for website
- Recruited new members

Community Service Chair

Sigma Phi Epsilon, UC San Diego

January - September 2019: Organized community service opportunities for the chapter.

Math Tutor

OneSpark Academy; Family Friends, Thousand Oaks, CA

2012 - 2015: Tutored students in pre-algebra through geometry.

Skills

Programming

- Python (2 years)
 - Data analysis and visualization
 - Unsupervised and supervised machine learning
 - Neural signal processing
 - Web scraping
- MATLAB (1.5 years)
 - EEGLAB toolbox
- JavaScript (0.5 years)
 - D3.js
- HTML & CSS (0.5 years)
- Version control: Git

Research

- Human subjects research
 - EEG
 - Pupillometry

Other

- Fluent in French
- Guitar, piano, and bass guitar (>15 years)

Additional Relevant Coursework

- Differential Equations and Dynamical Systems
- Discrete Mathematics and Graph Theory

Awards

International Baccalaureate (IB) Diploma

2016