Brian Barry

Email: barry.brian.f@gmail.com | Phone: (805)-750-2413 | github.com/bfbarry

Education

University of California, San Diego March 2020
BS: Cognitive Science (Machine Learning and Neural Computation)
Minor: Mathematics

Experience

Undergraduate Research Assistant *Voytek Lab, UC San Diego*

September 2019 - present: Assessing the correlation between spatial and temporal decompositions of a neural spiking raster (from Neuropixels) in Python. (PI: Dr. Bradley Voytek)

- Implementing pipeline that computes eigenvalue spectrum (via PCA) and power spectrum (via FFT) for incrementing subset sizes of random neurons
- Fitting exponents for both spectra at each subset size and computing the correlation between them at those subset sizes
- Presented findings at the Neuromatch 2020 conference, and hosted a poster at the Brain Criticality 2020 conference

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)

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

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)

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.

Projects and Extracurricular Activities

Founder — *Major Map Initiative, UC San Diego*

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

- 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 2019 - December 2019: Sought out and organized local 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

- Python (2 years)
  - Unsupervised and supervised machine learning
  - Data analysis and visualization in Jupyter Notebook
  - 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
- Human subjects research (EEG and pupillometry)
- 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