# 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 (via PCA) and power spectra (via 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 2020 - August 2020: Led the development of [majormap.ucsd.edu](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 2019 - 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**