

Brian Barry

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Education

University of California, San Diego

March 2020

BS: Cognitive Science (Machine Learning and Neural Computation)

Minor: Mathematics

Skills

Programming [skills]

Statistical analysis + machine learning

Modeling and simulation

Signal processing

Web scraping

Back-end development

Parallel processing

Version control (Git)

Programming [languages]

Python (3 years)

MATLAB (2 years)

SQL (1.5 years)

JavaScript + HTML + CSS (1.5 years)

Bash + Linux (1 year)

R (0.5 years)

Excel (4 years)

Data Visualization and Design

D3.js

Tableau

Matplotlib

Figma

Big Data Technologies

Apache Spark

AWS

HPC with PBS

TensorFlow

Languages

French (fluent)

Experience & Internships

Research Assistant, Voytek Lab, UCSD

September 2019 - February 2021

Investigated the correlation between spatial and temporal decompositions of neural spiking data using Python and Bash scripting with parallel processing.

- Built pipeline to compute power and eigenvalue spectra (from FFT & PCA), determine their exponents with linear regression, and measure their correlation
- Implemented Monte Carlo Markov Chain model to simulate neural data
- Presented findings at two conferences

Research Assistant, Swartz Center for Computational Neuroscience

April 2019 - February 2021

Analyzed EEG data from a rhythmic control task using MATLAB and Python, and wrote a plugin for EEGLAB incorporating a spectral parametrization module.

- Wrote scripts to automate ICA decomposition, epoching, and plotting figures
- Organized EEG component clusters and statistical tests with interactive HTML visualization
- Wrote source code and designed GUI components for the EEGLAB plugin.

Student, Neuromatch Academy

July 2021

[Neuromatch Academy](https://neuromatch.academy) is an intensive project based course focused on machine learning and quantitative modeling for computational neuroscience. *Team project topic*: Building a classifier to differentiate overt vs. imagined movement from ECoG data.

- Developed pipeline to engineer features from raw ECoG signal
- Trained and cross validated linear SVM on features

Founder, Major Map Initiative, UCSD**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.

- Implemented script in Python to scrape online course catalogs
- Developed graph traversal algorithm and designed front end for applet
- Recruited new members

Research Assistant, Stanford Behavioral and Functional Neuroscience Laboratory**February - March 2021**

Conducted pilot study consisting of behavioral experiments on SCO2 KI/KO mice models.

- Set up and conducted experiments, tracking activity with EthoVision XT software
- Analyzed data in Excel and presented results to the lab

Intern, Jet Propulsion Laboratory**June - August 2014**

Organized and compiled Voyager I residual radio data from Bash into Excel.

Additional Personal Projects**CollabSource (full stack web application)****January 2021 - Present**

- Implementing database and models using SQLite and flask sqlalchemy
- Engineering controllers for REST API
- Designing and developing frontend using React

Projects in Computational Linguistics (data science)**August 2020 - Present**

- Generating haikus with character and word level LSTM neural networks with TensorFlow
 - Haiku data obtained via Reddit API
- Investigating networks in language visually and statistically, spanning character level structure in the English vocabulary to semantic structure in NLTK's WordNet

Extracurricular Activities**Community Service Chair, Sigma Phi Epsilon, UC San Diego****January - September 2019**

Sought out and organized community service opportunities for the chapter.