Brian Barry

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Education

University of California, San Diego   **March 2020**

BS: Cognitive Science (Machine Learning and Neural Computation)   3.45 GPA
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

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.

- Built pipeline with parallel processing to compute correlations between exponents of eigenvalue spectra (from PCA) and power spectra (from FFT)
- Implemented computational models 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 wrote a plugin for EEGLAB incorporating a spectral parametrization module.

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

Student, Neuromatch Academy   **July 2021**

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 select 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.