

# Isaac Menchaca

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## Education

### B.S. Bioengineering, 2019

University of California, Riverside

- Additional courses from Computer Science Department: Introduction to Programming, Object-Oriented Programming, Discrete Structures, Machine Organization and Assembly Language, and Data Structures and Algorithms (C++, Python, LC-3).

## Technical Skills

- **Behavioral Experiment Implementation:** Psychtoolbox, psychoPy, jsPsych
- **Neuroimaging Data Collection and Processing Tools:** EEG, fMRI, EEGLAB, Nipype (FSM, SPM)
- **Programming and Version-Control:** Python, C++, Swift, Matlab, Shell-scripting/ Unix, Git
- **Data Retrieval, Merging, and Cleaning:** RDMS, SQLAlchemy / ipython-sql, Pandas, Numpy
- **Exploratory Data Analysis, Machine Learning:** Scikit-learn, Scipy, Statsmodels
- **Data Visualization:** Seaborn, Matplotlib, Plotly

## Experience

### Research Assistant

June 2019 - Present

*Cognitive and Neural Computation Lab — PI: Dr. Megan Peters*

- HIPAA/ CITI certified, MRI safety trained, data collection trained.
- Responsible for recruitment and maintenance of research participant forms (Subject Eligibility Criteria, MRI Screening, Research Informed Consent, and Research Participant Rights).
- Maintained strong documentation skills of project data and analysis using dedicated directories, implemented readme.md files, commented code, and Jupyter Notebook with markdown.
- Responsible for collection of behavioral, EEG, and fMRI data. (Psychtoolbox, psychoPy).
- Documented a preprocessing protocol and pipeline to clean, format, and analyze EEG and fMRI data. (Matlab, EEGLAB, Nipype, SPM, FSL, Python, Jupyter Notebooks).
- Documented a preprocessing protocol to clean pupillometry data (Matlab, ET\_Artifact\_removal).
- Protocol information: <https://isaacmenchaca.github.io/Guides>

### Diagnostics Assistant

October 2015 - December 2020

*Citrus Clonal Protection Program — Supervisor: Dr. Georgios Vidalakis*

- Assist in disease diagnostics to introduce, investigate, and maintain the safe mechanism of citrus varieties into California with accordance to state (CDFA) and federal policies (USDA).
- Assist in receiving, logging, and creating labels for nursery samples using BarTender.
- Undergo lab clean-up, autoclave, assistant training, and preparation of chemical solutions and diagnostic samples.
- Perform total nucleic acid extraction, purification, and quantitation.
- Perform PCR/ qPCR (SYBR Green and Taqman assays) for viroid/ pathogen detection.
- Organize and selectively collect queried sequence data from BLAST database using Unix, Cyberduck, and UCR's SSH cluster system.

## Projects

### Neural Alarm Clock (WakeRight)

October 2018 - May 2019

*Capstone Project — Advisors: Dr. Megan Peters and Dr. Kevin Freedman*

- Designed a system that prevents users from waking up during slow wave sleep (SWS), a factor of morning grogginess.
- Wrote an IRB for approval of human subject experimentation.
- Designed a working prototype with a budget of \$1000 (only \$150 used).
- Set a Bluetooth connection with consumer-grade EEG and self-made iOS app to receive real-time microvolt data. (Objective-C).
- Programmed iOS app to undergo real-time power spectral analysis. (Swift).
- Gave poster presentation of system to Bioengineering faculty and peers. Considered a top project by faculty.

### Color Respresentations in Primary and Extrastriate Visual Cortex (V1, V4)

July 2020

*Neuromatch Academy Project — Mentor: Dr. Gunnar Blohm*

- Worked on a reanalysis project to observe the ability to decode inferred color content from the Kay/ Gallant dataset using V1 and V4 voxels (dataset: <https://doi.org/10.1038/nature06713>).
- Used a recolorization toolbox to colorize the grayscale naturalistic images, and utilized k-means clustering to obtain the dominant RGB color of each image.
- Built two multi-output Lasso regression models for V1 and V4 to predict the dominant RGB values from the images.
- Improved and evaluated the models using hyperparameter tuning, cross-validation, and RMSE bootstrapping of shuffled test data and label identities.
- Project Information : <https://isaacmenchaca.github.io/2020/07/31/NeuromatchAcademy.html>

## Campus Involvement

### Member and Mentor

September 2016 - May 2019

*Biomedical Engineering Society (BMES)*

- Mentored a lower-standing Bioengineering student with similar interests. Gave advice on career path and classes, set goals, and helped with programming development skills.
- Contributed to Biohack, a beginner-friendly hack, as a committee mentor for iOS development using the xcode interface and Swift.

### Member and Counselor

October 2015 - July 2017

*Kindling Intellectual Development (K.I.D)*

- Provided educational mentorship to the youth of underprivileged communities at the First Congregational Church in Riverside, CA.
- Counseled a group of children for the organization's annual iDiscover education program.

## Continuing Education & Certifications

Neuromatch Academy, 2020

Career Track: Data Science with Python

Applied Machine Learning in Python

Databases and SQL for Data Science

Interactive Track

DataCamp

Coursera

Coursera

## Languages

- Spanish (Native)
- English