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**: Psychotoolbox, psychoPy, jsPsych
- **Neuroimaging Data Collection and Processing Tools**: EEG, fMRI, EEGLAB, Nipype (FSL, SPM)
- **Programming and Version-Control**: Python, C++, Swift, Matlab, Shell-scripting/ Unix, Git
- **Data Retrieval, Merging, and Cleaning**: RDMS, SQLAlchemy / ipython-sql, Pandas, Numpy
- **Machine Learning, Deep Learning, Data Analysis**: Scikit-learn, Keras, 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, commented code, and Jupyter Notebook with markdown.
- Responsible for collection of behavioral, EEG, and fMRI data, and the implementation of real-time fMRI decoded neurofeedback (Decnef). (Psychotoolbox, psychoPy).
- Documented protocols and pipelines to clean, format, and analyze pupillometry, EEG, and fMRI data. (Matlab, ET_Artifact_removal, EEGLAB, Nipype, SPM, FSL, Python, Jupyter Notebooks).
- Code information: https://isaacmenchaca.github.io/posts

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 prototype system that prevents users from waking up during slow wave sleep (SWS), a factor of morning grogginess, with a budget of $1000 (only $150 used).
- Wrote an IRB for approval of human subject experimentation.
- 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 to wake user. (Swift, Python).
- Suggested future enhancement implementation by using a Recurrent Neural Network on generated data to predict future time points. (Keras).
- Gave poster presentation of system to Bioengineering faculty and peers. Considered a top project by faculty.
- Project Information : https://isaacmenchaca.github.io/2020/09/13/SeniorCapstone1.html

Color Respresentations in Primary and Extrastriate Visual Cortex (V1, V4) **July 2020**

Neuromatch Academy Project — Mentor: Dr. Gunnar Blohm

- Gave a poster presentation 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 data science/ computational interests. Gave advice on career path and classes, set goals, and helped with programming development skills.
- Contributed to the implementation of UCR's new beginner-friendly hackathon, Biohack, as a committee member and 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 and tutoring to underrepresented students from low-income and homeless populations in San Bernardino City and Riverside Unified School Districts (SBUCD, RUSD).
- Counseled and mentored grade-school students for the organization's annual iDiscover education program.

Continuing Education & Certifications

Neuromatch Academy, 2020 — **Interactive Track**
Career Track: Data Science with Python — **DataCamp**
Introduction to Deep Learning with Keras — **DataCamp**
Applied Machine Learning in Python — **Coursera**
Databases and SQL for Data Science — **Coursera**

Languages

- Spanish (Native)
- English