Sean Berg

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Education

B.S. in Neurobiology, Physiology, and Behavior — Davis, CA
University of California, Davis — *Sep. 2021 – Mar. 2024*

A.A. in Liberal Arts: Natural Science — Gilroy, CA
Gavilan College / Gilroy Early College Academy - Concurrent — *Aug. 2017 – May. 2021*

Skills & Expertise

Behavior:
EEG Assays (ERPs - Audio & flash Visual; Developing Limb-motor & Performance ERPs)
Cognitive Assays (Pos./Neg. Operant Conditioning, NOR, SAT, EPM, LD)
Seizure Assays (Electro/chemo-convulsive Assessment, Febrile Seizures)

Laboratory Techniques:
Brain Surgery (Craniotomy), Animal Handling, Electroencephalography (Implantation & Processing), Neuron Cell Culturing (Primary Cortical), Colony Management, Histological Processing

Technical:
Python (matplotlib, MNE, Numpy, Scikit-Learn, tkinter, scipy) and MATLAB for EEG analysis, Embedded Systems (Signal Acquisition and Filtering), Neuroscore, Autodesk Fusion, SolidWorks, 3DSlicer, NEURON

Work Experience

Neuroscience Researcher - Junior Specialist — Aug. 2024 – Present
The Silverman Lab at UC Davis Health - Dr. Jill Silverman — *Sacramento, CA*

- Top aseptic survival surgeon at the Silverman Lab; Performed surgery on several highly successful epileptic mouse model cohorts implanted with wireless EEG telemeters for assessment of EEG associated trends in behavior
- Leading novel experimental procedures in positive operant condition performance that couple behavioral metrics with associated EEG electrophysiology trends beyond standard ERP paradigms.
- Streamlined several Python-based (MNE, Numpy, scipy) high-throughput analysis pipelines for EEG recordings.
- Managing several transgenic mouse models of rare neurodevelopmental disorders, including colony management, experimental design, and phenotypic biomarker characterization to inform preclinical translational intervention.
- Optimized several legacy data analysis platforms for effective use for lab members of all technical backgrounds with future proofing in mind.

Undergraduate Researcher — May 2023 – Jul. 2024
UC Davis Sensorimotor Integration Lab - Dr. Wilsaan Joiner — *Davis, CA*

- Collected and analyzed sensitive sensorimotor data in human subjects under UC Davis IRB guidelines to assess short-term motor learning in impaired populations, informing forelimb prosthetic development.
- Analyzed sensorimotor trajectories in MATLAB on kinematic recordings from force perturbation tasks to evaluate adaptive responses to proprioceptive disruption.
- Previously mentored under Dr. Joiner involving a project investigating somatosensory integration solutions in fore/hindlimb prosthetics.

Undergraduate Researcher — Mar. 2023 – Jun. 2023
UC Davis Neurobiology Lab - Dr. Mark Goldman — *Davis, CA*

- Designed a multi-modal comparison experimental project in differential human EEG PSD comparing stereotyped forelimb synchronization to a rhythmic auditory cue.
- Computationally modeled small-scale simulated neuronal networks in NEURON.

Personal Interests

- Rock Climbing
- Gardening and Beekeeping
- DIY EEG BCI