Jaskirat Billing

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EDUCATION

University of California, Berkeley — **Berkeley, CA**
Neuroscience & Data Science BA — *August 2023 - Present*

- GPA: 3.8/4.0
- **Coursework:** Neurobiology, Principles and Techniques of Data Science, Structure & Interpretation of Computer Programs, Scientific Logic & Communication, Linear Algebra, Organic Chemistry I & Lab, Gen. Biology & Lab, Calculus I & II, Physics I & II

EXPERIENCE

Undergraduate Research Assistant — **Berkeley, CA**
Jagust Lab, UC Berkeley — *January 2025 - Present*

- Reviewed and validated MRI and PET scans within the lab's **FreeSurfer** pipeline, ensuring accurate parcellation/segmentation and high-quality data for Alzheimer's and dementia research.
- Leading a multi-cohort longitudinal project of 3,000+ participants, analyzing associations between lifestyle, genetic, demographic, and neuropathological indices to discover novel biomarkers via linear mixed effects models.

Software Developer — **Berkeley, CA**
Neurotech@Berkeley — *January 2025 - May 2025*

- Built a U-Net segmentation model using **PyTorch** to detect and localize brain tumors in 3D MRI scans, implementing preprocessing pipelines, dice loss optimization, and performance evaluation using standard medical imaging metrics.
- Led weekly workshops covering current advances in neurotechnology attended by 30+ undergraduates.

Neurotechnology Course Developer — **Berkeley, CA**
Neurotech@Berkeley — *August 2024 - December 2024*

- Co-created an online course to be published on EdX with club members about topics in Neurotechnology
- Designed lectures on depression, PTSD, neurotransmission, molecular neuroanatomy, and Alzheimer's Disease.
- Participated in talks with industry professionals at Neuralink, Science Corp, and emerging neurotech startups.

PROJECTS

ECoG Visualization Tool
Feldman Lab, UC Berkeley

- Developed a python-based **GUI application** for visualizing Electrocorticography (ECoG) data with support for experimental events.
- Enables researchers to browse through neural recordings, view raw voltage, explore frequency band data, compute power spectral density and align neural activity with behavioral events.
- Used daily by 3+ researchers in the Feldman Lab to streamline tasks taking 1-2+ hours to just 5-10 minutes

SimpleFlow
Neurotech NVIDIA Hackathon (*2nd place*)

- Participated in a 2-day hackathon where we leveraged an **OpenBCI EEG Headset** connected to an 8-channel OpenBCI cyton board to capture electrical activity of a participant.
- Utilized advanced algorithms to calculate phase coherence between auditory stimuli and beta waves to infer auditory attention of students attending lectures remotely.
- Developed a GUI using JavaScript to display correlation between auditory and EEG signals, enabling educators to visually access students' engagement during the lecture.

TECHNICAL SKILLS

Programming: Python, MATLAB, JavaScript, HTML5/CSS3, Bash, SQL
Software: FreeSurfer, FSLeyes, Github, OpenBCI GUI, Linux, SSH, Latex
Libraries/Frameworks: Scikit-learn, Pytorch, SciPy, NumPy, Pandas, Matplotlib, Seaborn
Hardware: OpenBCI Cyton, OpenBCI UltraCortex mIV, Arduino UNO, PC Diagnostics and Repair.
Laboratory Procedures: PCR, SDS-Page, Chromatography, Spectroscopy, Filtration & Extraction, Recrystallization