Armaan Raina

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Education

North Carolina State University Dec. 2026
BS Computer Science - AI Concentration, BS Statistics *Raleigh, NC*
GPA: 4.0/4.0
Relevant Coursework: Neural Interface Engineering, Data Structures and Algorithms, Operating Systems, Neural Networks, Automated Learning and Data Analysis, Statistical Computing and Data Management, Database Management, Regression Analysis, Neurobiology, Neuromorphic Computing

Experience

Neurobiology Research Assistant - Meitzen Lab Jan. 2024 – Present
North Carolina State University *Raleigh, NC*

- Engineered 15+ time-frequency features from 500+ brain tissue recordings and utilized Sklearn and **PyTorch** to decode estrous phase **achieving 91.2% accuracy**, utilizing PSD and signal features extracted using Scipy
- Created a python script to automate merging 107 Excel sheets containing 10,000+ data points into a unified dataset for publication in the Dryad Data Repository, **reducing processing time by 95%**

Cofounder/President Aug. 2025 – Present
Neurotech at NC State *Raleigh, NC*

- Started a 25+ student organization focused on building EEG/EMG based neural interfaces and spreading awareness about neural engineering concepts
- Led workshops on neural data processing, educating members about the principles of electroencephalography and neuroscience
- Spearheaded grant writing and outreach efforts to obtain over $4,000 (and counting) in free hardware for projects being completed by the club

Biomechanics Research Assistant - Neuro Rehab Engineering Lab Aug. 2025 – Present
North Carolina State University *Raleigh, NC*

- Implemented 3+ actor-critic **reinforcement learning models in PyTorch** for non-targeted EMG decoding, processing 1000+ EMG signal samples with **85% classification accuracy**
- Researched **RL policy optimization** for implementation into a 3-DOF prosthetic hand, analyzing various model paradigms across 10 test scenarios

Innovation in Neurotech Fellow May 2025 – Aug. 2025
Washington University Medical School - Center for Innovation in Neuroscience and Technology *St. Louis, MO*

- Worked in a 6-person multidisciplinary team of engineers, neurosurgeons, and researchers to design and prototype a neurosurgical device addressing real-world clinical problems affecting 50,000+ patients annually
- Researched and integrated concepts from materials science, manufacturing, and neuroanatomy to propose and implement **feasible design modifications at the 50 micron scale**
- Led feasibility analysis on 8 prototypes, developing 3 testing apparatuses for demonstrating reduction to practice on novel ideas

Projects

Estrous Phase Decoder | *Python, Keras, Scipy, pyABF, os* Feb. 2025 – Present

- Processed 200+ raw electrophysiology recordings using os and pyABF libraries, handling 25GB+ of neural data
- Extracted 25+ experimental features using Scipy and PyWavelets for comparison with previously assessed MiniAnalysis features, **achieving 15% higher accuracy** in certain cases
- Compared classification accuracies across 10+ feature sets and 5 network configurations, determining top 3 most important features for **decoding estrous cycle phase with 93% accuracy**

Technical Skills

Languages: Java, Python, C, R, SAS, MATLAB, SQL
Libraries: Pandas, NumPy, Matplotlib, OpenCV, MNE, SciPy, Keras, PyTorch, Sklearn, Gymnasium