# Armaan Raina

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## Education

**North Carolina State University** Dec. 2026
*BS Computer Science, BS Statistics* *Raleigh, NC*
GPA: 4.0/4.0

## 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 Keras 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%**

**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, resulting in a **provisional patent application**

## 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**

**EEG Schizophrenia Classification** | *Python, Sklearn, NumPy, Pandas, MNE* June 2024 – Aug. 2024

- Read in, preprocessed, and analyzed 28 raw EEG files using MNE and numpy
- Visualized the EEG data using raster plots, power spectral density graphs, and topographical heatmaps
- Performed feature extraction by way of extracting band power from raw EEG data
- Implemented and trained an Sklearn RandomForestClassifier to **97.1% accuracy** on processed data

## Coursework

Software Development Fundamentals, C/Software Tools, Data Structures and Algorithms, Operating Systems, Introduction to AI, Neural Interface Engineering, Automated Learning and Data Analysis, Statistical Computing and Data Management, Regression Analysis, Neurobiology, Cognitive Processes

## Technical Skills

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