# 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