**Final Project Proposal Ideas**

**1. EEG Signal Denoising and Seizure Detection**

*Objective:* Develop a machine learning model to denoise EEG signals and accurately detect epileptic seizures.

*Dataset:* The CHB-MIT Scalp EEG Database comprises EEG recordings from pediatric subjects with intractable seizures. It includes 24-hour continuous recordings, providing ample data for training and validation.

*Reference:* CHB-MIT Scalp EEG Database

**2. MRI Image Restoration and Super-Resolution**

*Objective:* Enhance the quality of MRI images by implementing super-resolution techniques to improve diagnostic accuracy.

*Dataset:* The IXI Dataset offers T1, T2, and PD-weighted MRI images from over 500 subjects, facilitating the development of restoration algorithms.

*Reference:* IXI Dataset

**3. Cell Detection in Microscopy Images**

*Objective:* Create a model to detect and count cells in microscopy images, aiding in quantitative biological research.

*Dataset:* The BBBC005v1 dataset from the Broad Bioimage Benchmark Collection contains images of DAPI-stained nuclei, suitable for training cell detection models.

*Reference:* BBBC005v1

**4. Outcome Prediction Using Electronic Health Records (EHR) Data**

*Objective:* Predict patient outcomes, such as hospital readmission or mortality, by analyzing EHR data.

*Dataset:* The MIMIC-III Clinical Database includes de-identified health data from over 40,000 critical care patients, encompassing demographics, laboratory measurements, and clinical notes.

*Reference:* MIMIC-III Clinical Database