Real-time preictal detection through the application of machine learning to Electroencephalogram signals.

William Riddell

November 7, 2023

Contents

1 Introduction

Have 3 channels with the interictal, preictal, ictal and post ictal states labeled.

2 Methodology Comparison

2.1 Preprocessing

2.1.1 Butterworth Filter

2.1.2 Notch Filter

2.1.3 Averaging Filter

2.1.4 Large Laplacian Filter

2.1.5 Common Spatial Pattern

2.1.6 Empirical Mode Decomposition vs Power Spectral Density

2.2 Feature Extraction

2.2.1 Univariate Linear Regression

2.2.2 Spectral Power Features

2.2.3 Wavelet Energy and Wavelet Entropy

2.2.4 Intrinsic Mode Functions

2.2.5 Kurtosis

2.3 Machine Learning (ML) Models

2.3.1 Support Vector Machine

2.3.2 k-Nearest Neighbour

2.3.3 Naïve Bayes

2.3.4 Wavelet Transformation

3 Dataset Comparison

asdf (Riddell 2023)

Acronyms

ML Machine Learning. 2, 4

References

Riddell, W. (2023), *Test Book*, British London.