Feature Selection

Transformation

1. Signal R library: FFT, STFT, compute time-frequency statistics
2. Frequency band filtering: Delta ~ Gamma

For every subject

|  |  |  |  |
| --- | --- | --- | --- |
| Electrode 1/Delta | Electrode 1/Theta | …… | Electrode 1/Gamma |
| Electrode 2/Delta |  |  |  |
| …… |  |  |  |
| Electrode 19/Delta |  |  |  |

Feature Selection

1. Time-frequency properties (STFT)
2. Sample entropy
3. Microstate measures
4. Absolute power
5. Relative power
6. **Phase Locking Value (PLI): PhaseLocking package**
7. **Coherence：WaveletComp package**

Data Structure

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sub001 | Coherence 1 |  |  |  |  |  |
| Sub002 |  |  |  |  |  |  |
| Sub003 |  |  |  |  |  |  |
| Sub004 |  |  |  |  |  |  |

Unsupervised Learning: K-Means, GMM

Supervised Learning: LDA

Pipeline:   
1. Compute coherence/PLI etc. as the matrix of electrodes and frequency bands 🡪 95 metrics per subject

1. Flatten the matrix into a 1\*95 vector, stack all subject’s measure together 🡪 n \* 95 data frame
2. PCA on data frame 🡪 Score vector data frame
3. Clustering on score data frame
4. Repeat step 1-5 for other metrics

Work Assignment:

1. Owen: STFT, Coherence
2. Lydia: Reading and converting .set file to csv
3. Evelyn: frequency band filtering