Lez 1 – EKG & EEG signals

Purpose of the project

1. Screening of patients -> able to detect in normal population
   1. Healthy and diseased subjects
2. Diagnose patients
   1. Certainty of disease
   2. Characterization of disease
3. Predict response to treatments

Metrics of ML:

1. **Sensitivity** -> type of disease (diagnosing of disease)
2. **Specificity** -> absence of disease (screening of pop)

Realistically we cannot have both of them high

* It’s more important specificity because it allows for screening of population

Accuracy is a ROC-AUC (Receiver operator characteristics – Area Under Curve) and it’s a balance between sensitivity and specificity.

Dataset: 500 patients, EEG readings for epilepsy, 4096 channels. Each row is a sample (patient)

Values go from 1 to 5, with 1 low severity and 5 high severity.

Objective is to discriminate degree 3-4.

Train with 80% and 20% use for validation

Presentation:

1. Context on epilepsy
2. Aim of our tool: classify patients between mild and severe epilepsy (3-5)

Documents to be included:

1. Intro -> The Clinical problem
2. Task
3. Our solution
4. Methods
5. Datasets
6. Results
7. Conclusion

15-20 minutes

Delivery on 25/03/2024.

Sensitivity -> condition of higher importance (classifying correctly class 4)

Specificy -> condition of lower importance (distinguishing between 2 of them also considering class 3)

SMOTE  
ADASYN

Data:

* 20% randomly
* 80% K-fold Cross-Validation

Show the standard deviations of the metrics for each iteration of cross validation

70% +- 10% for example

1. Criterion
   1. Cut-off features (features selection)
   2. Standard univariate method (t-test)
   3. Standard multivariate method