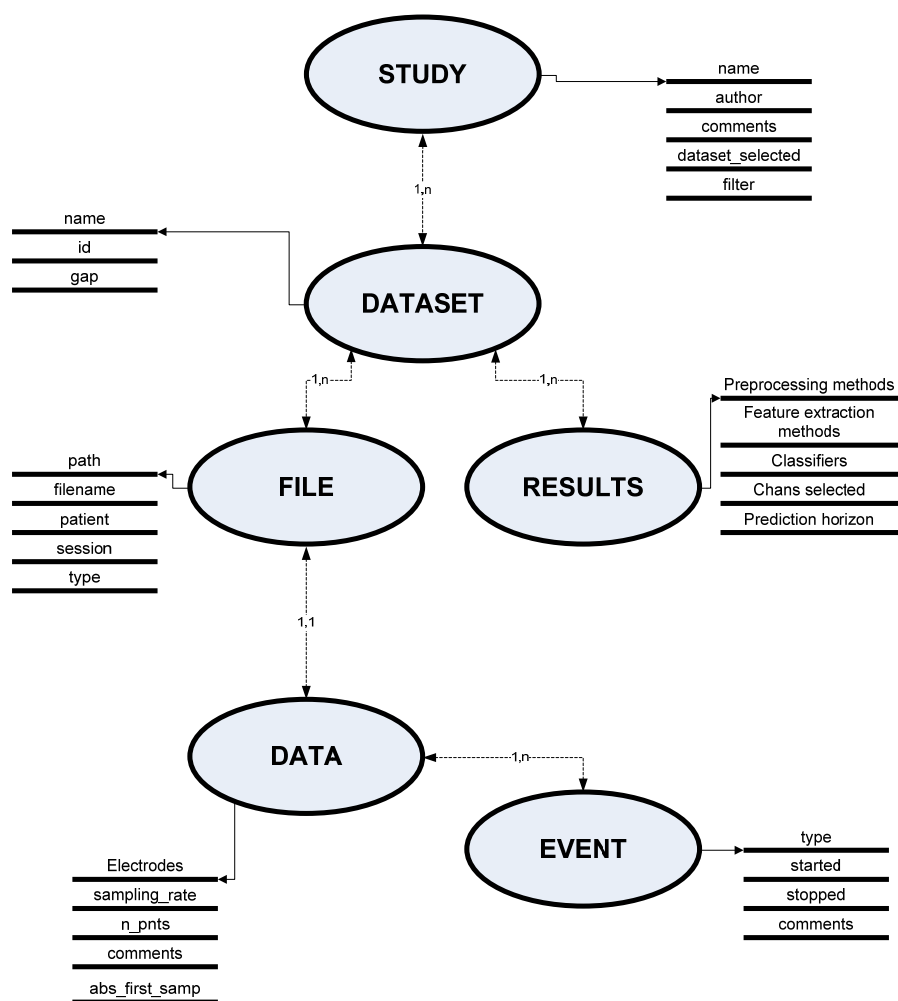# NOTES ABOUT THE .MAT STRUCTURES FOR TP3 (CA/CNSD)

The '.mat' file presented is the data structure of the Framework EpiLab. The signal processing tool EpiLab (developed @CISUC), was planned to classify brain patterns using the EEG signal.

THE STRUCTURE

To integrate all the information from different files the following classes' structure was designed.

THE DATA

The organization is based in an Object-Oriented programming, recently implemented in Matlab, allowing a better integration of information. The class Study represents a general overview of the software data, containing general information about the studies in progress. Several Datasets can be associated. Each dataset contains a name, an id, one or several files and an object Results (corresponds to all the results calculated for that particular dataset).

To access this information one can use the following code

>study.dataset.results.featureExtractionMethods

This class (Epilab_results) contains several structs (one for each available method). In this work only two methods will be available – Energy and WaveletCoefficientEnergy.

Each method has the time stamps vector (>study.dataset.results.featureExtractionMethods.WaveletCoefficientEnergy.time) and the results per se (>study.dataset.results.featureExtractionMethods.WaveletCoefficientEnergy.c_) available in the appropriate attributes. The time stamps is represented in seconds; do not forget to consider the sampling rate when converting the seizure time stamp to the features time stamp.

THE EVENTS

To generate the target vector, the user should know the time stamps of the seizures' onset. This information is available in the information of each file. To access the events of the first file of the dataset and its information use

> study.dataset.file(1).data.eeg_events

Each eeg_events is composed of 4 properties: type, started, stopped and coments. The important type for this study is the type 'EEG-ON' and the time stamp presented in the started property. The end of the seizure is represented by the tag 'EEG-OFF' and the time stamp is in the started property.

THE TARGET

The target should be composed of 4 different classes: 1- normal, 2- pre-ictal (period before the seizure), 3 ictal and 4 pos-ictal.

A simple approach is to look for the time stamp where the seizure begins and design the target around it. Consider that a seizure begins in the absolute sample 1024000.

The sampling rate is available using

sampling_rate = study.dataset.file(1).data.sampling_rate

For example, if sampling_rate is 1024Hz the target would be generated as follows.

1024000/1024(consider the sampling_rate as 1024) = 1000s

So the target should look like

Time_stamp	target	features
300	1	…
305	1	
310	1	
…	…	
700	2	
705	2	
…	…	
1000	3	
1005	3	
1010	4	

For any further assistance do not hesitate to contact

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