FEATURES EXTRACTION

Blind to all the things 🡪 Aim: doing as much features as possible

# Methods

## Features on Power Spectrum

Mettre un figure avec tout

**meanPSD -** The average frequency calculated as the sum of product of the power spectrum and the frequency divided by the total sum of the power spectrum.

**stdPSD -** The deviation of the spectrum frequencies from the mean frequency

**medPSD -** The frequency which separates higher half of the spectral power from the lower half

**bw -** The difference between the upper frequency where the power is 3 dB lower maximum and the lower frequency where response is 3 dB lower

**p25 -** The frequency below which a quarter of the spectral power lies

**p75 -** The frequency below which three quarter of the spectral power lies

**IQR -** Interquartile range, i.e. Tthe frequency range between p25 and p75

**TP -** Total power in the 100-1000 Hz range

**p100-200 -** Power in the 100-200 Hz range divided by TP

**p200-400 -** Power in the 200-400 Hz range divided by TP

**p400-800 -** Power in the 400-800 Hz range divided by TP

**p800-1200 -** Power in the 800-1200 Hz range divided by TP

**spectrum-slope -**The rate at which the sound spectrum power tails off or decreases from mean frequency to higher frequencies. The value represents the gradient of the linear regression line fitted to the power in logarithmic octave scale. Mettre figure

**r-square2 -** Statistical measure of how close the data is to the fitted regression line

## Power Spectrum Fit

Aim: Obtain other information on the power spectrum by fit it to some models. On a choisi de regarder des informations sur les peaks.

LE faire sur 10\*log10 comme les autres ??

### MAF: Moving Average Filter

Qu’est-ce que c’est ? Pourquoi avoir choisi ca ?

Mettre figure

**nb\_pks\_MAF –** Nombre de peaks

**f\_higherPk\_MAF –** Fréquence du maximum

**dif\_higherPks\_MAF –** Différence en fréquence entre les 2 peaks (relative)

### Gaussian Mixture Model

Ici avec 4 gaussiennes. Pourquoi?

Mettre figure

Gaussian parameters: Pour chaque Gaussienne, on récupère

**a=[fi.a1, fi.a2, fi.a3, fi.a4];**

**b=[fi.b1, fi.b2, fi.b3, fi.b4];**

**c=[fi.c1, fi.c2, fi.c3, fi.c4];**

**Peaks features :**

**nb\_pks\_MAF –** Nombre de peaks

**f\_higherPk\_MAF –** Fréquence du maximum

**dif\_higherPks\_MAF –** Différence en fréquence entre les 2 peaks (relative)

## MFCC Coefficients

Les 6 premiers coefficients.

Attention aux discontinuités quand on enleve les pleurs 🡪 on prend le signal avec pleurs, on clacule les coefficients MFCC et apres on enleve les coeeficients MFCC qui correpondent aux pleurs.

## LPC Coefficients

A voir

# Results

Résults

# Discussion

Discussion d’un point de vue ingénieur.

Discussion médicale.