1. Chunk of signals of 1 second with an overlap of 0.5 second.

2. Ocular correction via a Recursive Least-Squares algorithm based on (P. He et al., Med. Biol. Comput. 42 (2004), 407-412) developed in Matlab by German Gomez-Herrero (GNU General Public License).

3. Correction of the EMG interference with the method developed by Sheer (Sheer D.E. "Biofeedback training of 40-Hz eeg and behavior", pp. 325-362, on Behavior and brain electrical activity (1975), Plenum Press. New York).

   This is a simple linear derivation between the signal of the EMG (in m y case I take 60 - 80 Hz) and EEG for gamma (35-45 Hz)

4. Phase synchrony based on (Pikovsky, A. R. (2001). Synchronization. A Universal Concept In Nonlinear Sciences. Cambridge: Cambridge University Press, pag. 368 A2.7).

   Mathematically is done in this way:

   $$\varphi_1(t) - \varphi_2(t) = \tan^{-1} \frac{s_{H,1}(t)s_2(t) - s_1(t)s_{H,2}(t)}{s_1(t)s_2(t) + s_{H,1}(t)s_{H,2}(t)}$$

   Where the S_H is the Hilbert transform of the incoming signal

5. Calculation of the Rho index in this way:

   $$\rho = \sqrt{\left(\sum_{n=1}^{N} \sin(\varphi_1 - \varphi_2) \right)^2 + \left(\sum_{n=1}^{N} \cos(\varphi_1 - \varphi_2) \right)^2}$$

   so that I have an index that goes between 0 and 1