Project   Neural Networks
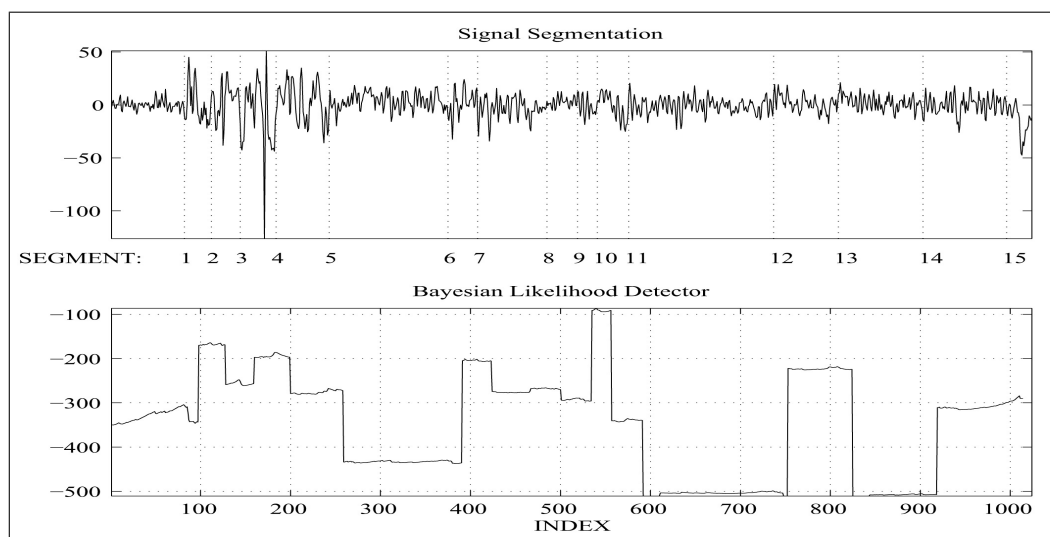
Classification of EEG signal segments

Classification of values of the EEG signal $\{d(n)\}_{n=0}^{N-1}$ in the file SEGMENTS.MAT with its $N = 1024$ values recorded with the sampling frequency of $f_s = 128$ Hz. Indices of Q separate segments are in vector s.

The projects should include:

1. Introduction specifying methods of EEG signals acquisition and goals of their processing with links to references

2. Methodology of EEG data processing and signal segments classification

3. Results of spectral features estimation using the discrete Fourier transform for each segment and construction of the pattern matrix $\mathbf{P}_{2,Q}$ defined by the mean power in two selected frequency bands related to the whole power using:

   (a) α-band: $\langle 8, 13 \rangle$ Hz and β-band: $\langle 13, 30 \rangle$ Hz
   (b) α-band: $\langle 8, 13 \rangle$ Hz and γ-band: $\langle 30, 60 \rangle$ Hz
   (c) β-band: $\langle 13, 30 \rangle$ Hz and γ-band: $\langle 30, 60 \rangle$ Hz

4. Visualization of location of signal features in individual windows and their neural network classification into the selected number of classes for $S = 2, 3, 4$.

5. Association of signal segments with individual classes together with evaluation of mean values and standard deviations of separate classes.

6. Discussion presenting typical signal segments for each class

7. Conclusion

8. References