

# Auditory Evoked Potentials (AEPs) Response Classification: A Fast Fourier Transform (FFT) and Support Vector Machine (SVM) Approach

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## Abstract

Hearing loss has become the world's most widespread sensory impairment. The applicability of a traditional hearing test is limited as it allows the subject to provide a direct response. The main aim of this study is to build an intelligent hearing level evaluation method using possible auditory evoked signals (AEPs). AEP responses are subjected to fixed acoustic stimulation strength for usual auditory and abnormal ear subjects to detect the hearing disorder. In this paper, the AEP responses have been captured from the sixteen subjects when the subject hears the auditory stimulus in the left or right ear. Then, the features have extracted with the help of Fast Fourier Transform (FFT), Power Spectral Density (PSD), Spectral Centroids, Standard Deviation algorithms. To classify the extracted features, the Support Vector Machine (SVM) approach using Radial Basis Kernel Function (RBF) has been used. Finally, the performance of the classifier in terms of accuracy, confusion matrix, true positive and false negative rate, precision, recall, and Cohen-Kappa-Score have been evaluated. The

maximum classification accuracy of the developed SVM model with FFT feature was observed 95.29% (10 s time windows) which clearly indicates that the method provides a very encouraging performance for detecting the AEPs responses.

## Keywords

EEG BCI Auditory evoked potential Machine learning SVM  
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## Notes

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