# The Classification of Blinking: An Evaluation of Significant Time-Domain Features

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**ABSTRACT**

Stroke is one of the most widespread causes of disability-adjusted life-years (DALYs). EEG-based Brain-Computer Interface (BCI) system is a potential solution for the patients to help them regain their mobility. The study aims to classify eye blinks through features extracted from time-domain EEG signals. Six features (mean, standard deviation, root mean square, skewness, kurtosis and peak-to-peak) from five channels (AF3, AF4, T7, T8 and Pz) were collected from five healthy subjects (three male and two female) aged between 22 and 24. The Chi-square ($\chi^2$) method was used to identify significant features. Six machine learning models, i.e. Support Vector Machine (SVM)), Logistic Regression (LR), Random Forest (RF), Naïve Bayes (NB) and Artificial Neural Networks (ANN), were developed based on all the extracted features as well as the identified significant features. The training and test datasets were divided into a ratio of 70:30. It is shown that the classification accuracy of the evaluated classifiers by considering the fifteen features selected through the Chi-square is comparable to that of the selection of all features. The highest classification accuracy was demonstrated via the RF classifier for both cases. The findings suggest that even that with a reduced feature set, a reasonably high classification accuracy could be achieved, i.e., 91% on the test set. This observation further implies the viable implementation of BCI applications with a reduced computational expense.

**KEYWORDS**

Blink; EEG; Feature selection; Machine learning

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