Abstract

Electrooculography based bio signals have been used and applied as a control signal in several Human Computer Interactions. EOG is a technique of recording corneal-retinal potential associated with eye movement. An HCI captures and decodes EOG signals and transforms human eye movement into actions. This paper proposes algorithms for identifying eleven eye movement signals acquired from twenty subjects using static and dynamic networks. Convolution technique is used to extract the features. These features are trained and tested with two neural networks, namely time delay neural network and feed forward neural network. The results obtained are compared with Singular Value Decomposition features for same networks. Classification accuracies varied from 90.99% and 90.10% for convolution features and 90.88% and 89.92% for SVD features using time delay neural network and feed forward neural network respectively. From the results it is observed that Convolution features using Time Delay Neural Network has better classification rates in comparison with SVD features.


Identifying Eye Movements using Neural Networks for Human Computer Interaction

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Index Terms

Computer Science

Artificial Intelligence
Keywords

Electrooculography  Human Computer Interaction  Convolution Features  Singular Value Decomposition

Feed Forward Neural Network

Time Delay Neural Network

Multi Layer Perceptron

Fast Fourier Transform.