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# Automatic detection of EEG signals contaminated with ocular artifacts using the measure of kurtosis

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**Abstract**

Electroencephalography (EEG) is one of the most widespread techniques of recording brain electrical activity which employs in a wide range of recognition and treatment routines. One of the common problems in EEG recording is the artifacts arising from sources except the brain and significantly contaminated the resulting signals. Among the most important of these artifacts are the ocular artifacts which are caused by eye movement and blinking during signal recording. In order to obtain EEG signals that can be used in different applications, it is first necessary to identify the contaminated signals and at the later step, remove the artifacts from the contaminated components. The purpose of this paper is to emphasize the diagnostic process of contaminated signals by providing a novel method for their automatic detection. To this end, for the first time, a semi-simulated standard data set has been used in which EEG signals without artifacts are manually contaminated with visual artifacts using a realistic model. The use of these standard artifact-free brain signals makes it possible to evaluate and compare the performance of different diagnostic methods. In the method presented in this paper, the measure of kurtosis is used to automatically detect contaminated components and a two-sided confidence interval of ninety-five percent of the mean is used to determine the threshold of kurtosis. Moreover, the performance of this measure has been evaluated by sensitivity and specificity criterions for the correct identification of contaminated and non-artifact components.**Keywords**: Electroencephalography, Ocular artifact, Kurtosis, Sensitivity, Specificity.

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