

Paper Title: A Bispectrum-based Approach for Detecting Deception using EEG Signals

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Abstract:

This paper presents an electroencephalography (EEG)-based brain computer interface (BCI) system for deception detection. The proposed system utilizes higher-order spectra (HOS) analysis, namely the bispectrum analysis, to construct a representation of the EEG signals. The obtained bispectrum representation is utilized to extract a set of features that can be used to identify deception in EEG signals. The extracted features are used to train a support vector machine (SVM) classifier with a radial basis kernel function (RBF). The trained classifier is used to identify whether an EEG segment represents a guilty segment or an innocent segment. In order to evaluate the performance of the proposed EEG-based BCI system, EEG signals were recorded from eleven subjects who participated in a guilty knowledge test (GKT). The experimental results demonstrate the feasibility of applying the proposed approach to detect deception using EEG signals, with an average classification accuracy of 74%.