

Classifications of Sleep Apnea (Obstructive, Central, Mixed) and Hypopnea Events Using Wavelet Packet Transform and Support Vector Machines (VSM)

Authors : Benghenia Hadj Abd El Kader

Abstract : Sleep apnea events as obstructive, central, mixed or hypopnea are characterized by frequent breathing cessations or reduction in upper airflow during sleep. An advanced method for analyzing the patterning of biomedical signals to recognize obstructive sleep apnea and hypopnea is presented. In the aim to extract characteristic parameters, which will be used for classifying the above stated (obstructive, central, mixed) sleep apnea and hypopnea, the proposed method is based first on the analysis of polysomnography signals such as electrocardiogram signal (ECG) and electromyogram (EMG), then classification of the (obstructive, central, mixed) sleep apnea and hypopnea. The analysis is carried out using the wavelet transform technique in order to extract characteristic parameters whereas classification is carried out by applying the SVM (support vector machine) technique. The obtained results show good recognition rates using characteristic parameters.

Keywords : obstructive, central, mixed, sleep apnea, hypopnea, ECG, EMG, wavelet transform, SVM classifier

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