عنوان مقاله:

A Time-Frequency Approach For EEG Spike Detection

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خلاصه مقاله:

This paper presents a new method for detecting EEG spikes using the time-frequency distribution of the signal. As spikes are short-time broadband events, their energy patterns are represented as ridges in thetime-frequency domain. In this domain, the high instantaneous energy of the spikes makes them moredistinguishable from the background. To detect spikes, the time-frequency distribution of the signal of interest is first enhanced to attenuate the noise. Two frequency slices of the enhanced time-frequency distribution are then extracted and subjected to the smoothed nonlinear energy operator (SNEO). Finally, the output of theSNEO is thresholded to localise the position of the spikes in the signal. The SNEO is employed to accentuatethe spike signature in the extracted frequency slices. A spike is considered to exist in the time domain signal if the spike signature is detected at the same position in both frequency slices. The performance of the proposed method is evaluated and compared with an existing spike detection method using both synthetic and newborn EEG signals.

کلمات کلیدی:

EEG % Nonlinear energy operator % Spike detection % Time-frequency distribution % WVD % Seizure % Time-frequency analysis