عنوان مقاله:

Sleep Stage Classification using Laplacian Score Feature Selection Method by Single Channel EEG

نویسندگان:

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خلاصه مقاله:

Sleep is a normal state in humans and the subconscious level of brain activity increases during sleep. The brain plays a prominent role during sleep, so a variety of mental and brain-related diseases can be identified through sleep analysis. A complete sleep period according to the two world standards R&K and AASM consists of seven and five steps, respectively. To diagnose diseases through sleep, it is necessary to identify different stages of sleep because the disorder at each stage indicates a certain disease. On the other hand, efficient and useful features should be selected to increase the accuracy of sleep stage classification. In this paper, at first, different statistical, entropy, and chaotic features are extracted from sleep data. Afterwards, by introducing and using the Laplacian score selector, the best feature set is selected. At the end, some conventional classification algorithms such as SVM, ANN and KNN are used to classify different sleep stages. Simulation results confirms the superiority of the proposed method based on the classification results. With the proposed algorithm, ۲, ۳, ۴, ۵ and ۶ stages of sleep were classified by SVM and decision tree with ۹۸.۰%, ۹۸.۰%, ۹۷.۳%, ۹۶.۶%, and ۹۵.۰% accuracy, which are more superior to previous method's results.

کلمات کلیدی:

Chaotic Features, Sleep Stage Classification, EEG, Laplacian Score

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