



Epilepsy Recognition Using Mixture Autoregressive with Two First Order autoregressive Components

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Abstract: Most real-world time series such as oil prices, stock prices, inflation rates, etc. are complex and usually non-linear. Therefore linear models alone are not useful for modeling linear and nonlinear patterns in time series data at the same time. In recent years mixture autoregressive model (MAR) are developed for modeling nonlinear time series. Recently Maleki and Nematollahi used a version of AR model with two components normal mixture for modeling EEG data. Maharaj and Alonso tackled the same problem using wavelet method. They used wavelet various to find the discrimination rule for discrimination between a set of healthy EEG signals and a set of EEG recordings during seizure activity. This paper is concerned with the application of discriminating two MAR models to detect epileptic attacks. The EM algorithm is organized for fitting MAR model to a class of time series data. The Likelihood ratio criterion is provided for discrimination of two MAR models with two AR(1) components. Presented method is applied for discrimination between healthy and epileptic EEG signals rate. Low discrimination error rate based on small samples show the ability of proposed method, this results show advantage of Likelihood ratio of MAR models for detecting epileptic attacks.

Keywords: EEG; Epilepsy attack diagnosis; Likelihood ratio; Mixture autoregressive model; Time series discrimination

References

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