

Classification of Epilepsy Groups using EEG Signals and Patient Properties

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Abstract

One of the most important problems in the hospitals is classification of epilepsy groups. Classification of epilepsy groups (CEG) is also an important indicator for assessing the prognosis and drug treatment. We used feed-forward neural network approach and regression model for prediction of the CEG based on the inputs obtained from the EEG signals and properties of the patients. In the neural network, inputs (sex, age of seizure groups, seizure types, and the loss of consciousness, blood pressure values, and frequency bands from EEG signals) and a single output (CEG) were used. In the study that used a single intermediate layer, Levenberg-Marquardt was chosen as training algorithm and the study was applied in Matlab 14a. Learning, validation, test and system performance were examined for different neuron numbers. The neural network results were compared with the linear regression model. R square was also expected as above 90 percent. The neural network model used for the CEG was achieved 94 percent. This showed that the neural network performed better than linear regression.

Keywords

Classification, epilepsy, EEG signals, feed forward neural network, regression

Biographies

Erçin Özcan is a research assistant in Department of Electrical-Electronic Engineering at the Çukurova University. I am also a PhD student in the same department. My research interests include signal processing, artificial neural network.

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