

Epileptic Seizure Detection from EEG signals using Machine Learning

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Abstract: Epilepsy is nothing but neurological disorders affecting a significant portion of the world's population and approximately 2.5 million people in the United States. We propose a software based automated seizure detection system which will detect a seizure from electroencephalography (EEG) signals using machine learning algorithm. The propose system validate or test the values or signals given by user (Doctor) and then it predicate whether the epilepsy is detected or not. There are several ways to diagnose epilepsy by clinical examinations. However, the diagnosis can be best performed by electroencephalography (EEG) due to its high temporal resolution. EEG is a process of measuring electrical activity in the brain. The manual seizure detection process is a tedious and time consuming task, which necessitates automated seizure detection systems which can detect seizures quickly. We are using Support Vector Machine algorithm for classification. It will predict whether the epilepsy is detected or not. After prediction of epilepsy message will be send to patient's relatives.

Keywords: Epilepsy, Electroencephalography, Seizure, Neurological, Support Vector Machine

1. Introduction

The purpose of this document is to present detailed description of software for accurate epilepsy seizure detection. It will detect epilepsy seizure. The purposed software take input from user and validate by using training dataset and detect the epileptic seizure. Seizures caused by epilepsy are unprovoked, they disrupt the mantel activity of the patient and impair their normal motor and sensorial functions, endangering the patient's well- being. Exploiting today's technology it is possible to create automatic systems to monitor and evaluate patients. An area of special interest is the automatic analysis of EEG signals. This paper presents extensive analysis of feature extraction and classification methods that have reported good results in Other EEG based problems.

Several methods are detailed to extract 52 features from the time, frequency and time-frequency domains in order to characterize the EEG signals. Additionally, 10 different classification models, together with a feature selection method, are implemented using these features to identify if a signal corresponds to an epileptic state. The experiments were performed using the standard SVM and the proposed method achieve results comparable to those in the state-of-the-art for

the three and four classes problems.

In this way in this project we are going to predict epilepsy seizure. For that prediction here we are applying or using support vector machine algorithm. There are many classification algorithms but we are using support vector machine because it gives accurate re- sults.it requires more time for processing but it is more accurate. In medical field accuracy is very important hence it is very much better algorithm for epilepsy detection.

2. Objectives

- To Overcome the problem of Epilepsy.
- To detect the Seizure at earlier stage.
- Creating People Awareness about Health.

3. Scope of the Project

Epilepsy seizure detection software that doctor can use to detect epilepsy seizure at early stage. In that software patient's data can be stored. It will be used for detection. With the help of various parameters of patient's data, software can detect epilepsy seizure.

After detection of epilepsy seizure Results will be send to relatives of patient's through the message. It will be helpful for relatives to take care of patients or for proper treatment of patients at right time.

4. Motivation of the Project

- Seizures, affects approximately 1 of the world population.
- 30 to 40 percent of patient, antiepileptic drugs cannot effectively control seizures.
- Uncontrolled epilepsy can lead to depression.
- Uncontrolled epilepsy can lead to Higher cost.

5. Conclusion

We have proposed an epilepsy seizure detection software, which predict seizure at earlier stage. This sys- tem take input which are the signals or parameters of patients, and then Predict whether Epilepsy is detected or not. This system uses Support vector machine algorithm for classification. We are going to use

Support vector machine and ID3 algorithms for classification. We can compare them and determine which algorithm gives better result.

As we know that support vector machine required more time for computation but it gives better results. it is more accurate than other algorithms. hence our system will give better or accurate results. After detection of epilepsy alert signal in the form of message will be send to relatives of patient from doctor. Then they are able to take care of that patient and make treatment for that patient at early stage.

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