

# Removal of Eeg-Ecg Artefacts using Ann Classifier

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*Abstract: Internet has a wide door to an innovative style of gaining knowledge. The amount of information available therein exceeds that of any physical library. There are many uses of internet but academic purpose conquers the highest desirable position as far as students are concerned. Generally, the college-going students have an immense variety of subjects in the core area which is sometimes difficult for the students to understand. So they have chosen internet where there is a lot of information provided about the area of their study. Nowadays internet plays a major role in and around the people and makes them depend on it for each and everything. This is mainly affected by student's community where they use internet for various purpose like getting notes for studies, doing the assignment and other related activity and also for communications. Almost every engineering student is required to take the corresponding engineering course which is highly impacted over the area which they have chosen.*

## I. INTRODUCTION

Internet has a wide door to an innovative style of gaining knowledge. The amount of information available therein exceeds that of any physical library. There are many uses of internet but academic purpose conquers the highest desirable position as far as students are concerned. Generally, the college-going students have an immense variety of subjects in the core area which is sometimes difficult for the students to understand. So they have chosen internet where there is a lot of information provided about the area of their study. Nowadays internet plays a major role in and around the people and makes them depend on it for each and everything. This is mainly affected by student's community where they use internet for various purpose like getting notes for studies, doing the assignment and other related activity and also for communications. Almost every engineering student is required to take the corresponding engineering course which is highly impacted over the area which they have chosen.

This simultaneous acquisition of Electroencephalography (EEG) data enables the investigation of human brain functions with high spatial-temporal resolution. The cardiograph (ECG) is that the method of recording the electrical activity of the guts over an amount of your time by victimization the electrodes that is placed over the skin[1-3]. It is commonly performed to detect any cardiac problems. EEG is most frequently wont to diagnose brain disease that causes abnormalities in EEG readings. It is also used to diagnose sleep disorders, depth of anaesthesia, coma, encephalopathies and brain death. Simultaneous EEG signals is nowadays widely used, particularly for the non-invasive identification of cardiac foci and for the mapping for the neuronal oscillations at rest and the movement. Human brain controls the internal and external behaviour of the human body. Brain signals can be acquired from MRI, FMRI and so on. EEG signals are bio potential generate neural activity of the brain. Used particularly for the non-invasive identification of cardiac foci and for the mapping for the neuronal oscillations at rest and the movement[4-7]. It is used to diagnose sleep disorders, depth of anaesthesia, coma, encephalopathy and brain death. Frequency range of bioelectrical signal EEG amplitude is  $2\mu\text{V}$ - $100\mu\text{V}$ . EEG signal is assessed in 5 band for analyse work. ECG signal is that the tactic of recording the electrical activity of the middle over a quantity of it slowexploitation electrodes placed over the skin. It is commonly performed to detect any cardiac problems. Frequency range of bioelectrical signal EEG amplitude is  $50\mu\text{V}$ - $5\mu\text{V}$ [8-12].

## Neural Network (NN) Classifiers

1. Feed forward Neural Network(FNN) Artificial Neuron(computer vision and speech recognition).
2. Radial Basis Functional Neural Network (RBFNN)(power restoration systems).
3. Kohonen Self Organizing Neural Network (KSONN)(recognize patterns in the data).
4. Recurrent Neural Network(RNN)-Long Short Term Memory(LSTM)  
(Text to speech conversion).
5. Artificial Neural Network(ANN)  
(Medical diagnosis).
6. Convolution Neural Network(CNN)(signal processing and image processing).
7. Modular Neural Network(MNN)(artificial neural networks research).

In this work, we are using ANN classifier because it is fully connected nodes which are very useful in the medical fieldssshown in fig 7&8.

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## Artificial Neural Network(ANN) Classifier

An Artificial Neural Network (ANN) shown in Fig.9 is associate degree IP paradigm that's galvanized by the approach biological nervous systems, like the brain, method info. The key part of this paradigm is that the novel structure of the knowledge process system. It is composed of an outsized range of extremely interconnected process parts (neurons) operating in unison to unravel specific issues. These artificial networks may be used for predictive modelling, adaptive control and applications where they can be trained via a dataset.



Fig.9 Artificial Neural Network

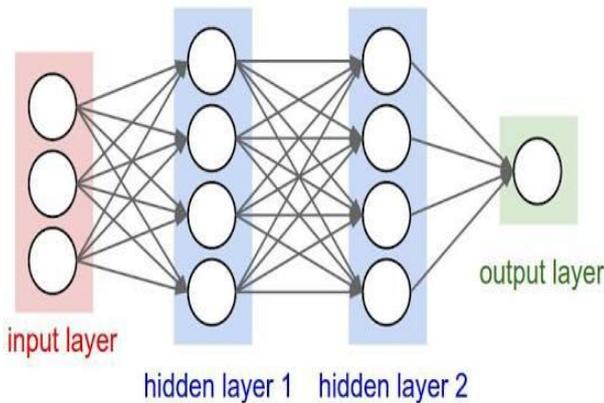


Fig.10 Work Model of ANN Classifier

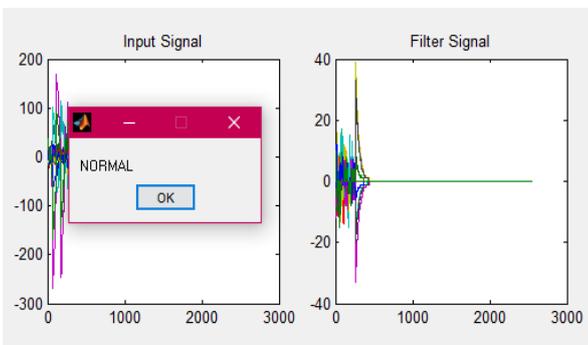


Fig.11 Normal Signal

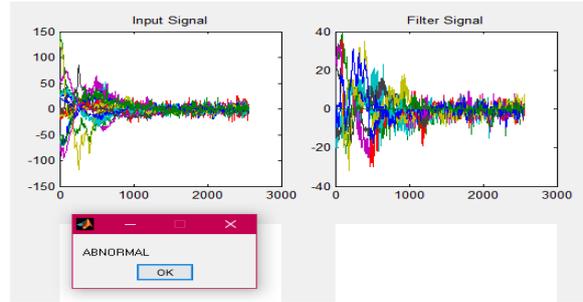


Fig.12 Abnormal Signal

## II. METHODOLOGY

In this work, the diagnosis system presents to classify the EEG brain signal of patient to distinguish between normal and abnormal which are cardiac with better classification accuracy. Here, the system uses the Artificial Neural network (ANN) with feed forward for classification which follows the Neural Network (NN) classification with Data Set training. For training, the statistical principal features will be extracted with the help of data base samples. The test sample will be classified using Artificial Neural network classifier parameters and its features. The system provides higher performance accuracy for various check samples. The second one is the reliability checking tool used for analysing the EEG signals, removing and recognizing the artefacts to process the signal datasets. EEG signal processing in built plug-in under MATLAB environment, while looking at all the possible technologies, libraries, platforms that will use in this research work; it has seen that the most convenient programming language for this work is inbuilt plug-ins which work under MATLAB environment. MATLAB software uses GUI(Graphical User Interface) to present the signal processing for this project using code.

## III. CONCLUSION

The proposed design will deal with critical issues faced by patients in the medical field and will help to solve them with technically sound equipments and ideas. The ECG is used for diagnosis of heart disease. Various supervised and unsupervised ANN model have been proposed in the literature for ECG signals feature extraction and classification. The ANN classifier was fed by parameters derived from the heart rate signals are discussed shown in fig 9-12.

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