**LITERATURE SURVEY**

**CLASSIFICATION OF ARRYTHMIA BY USING DEEP LEARNING WITH 2-D ECG SPECTRAL IMAGE REPRESENTATION**

**Authors’ Name**:Amin Ullah, Syed Muhammad Anwar , Muhammad Bilal and Raja Majid Mehmood

**Year of Publishing:** 2020

**Description:**

The authors conducted a study of ECG of various Arrythmia patients. They proposed atwo-dimensional (2-D) convolutional neural network (CNN) model for the classification of ECGsignals into eight classes; namely, normal beat, premature ventricular contraction beat, paced beat,right bundle branch block beat, left bundle branch block beat, atrial premature contraction beat,ventricular flutter wave beat, and ventricular escape beat. They achieved a state-of-the-art average classification accuracy of 99.11%.

**Authors’ Name**:SahabUl Hassan,Mohd S Zahid,Talal Abdullah,Khaleel Hussain

**Year of Publishing**:2022

**Description:**

They proposed a solution which involves a novel deep learning model, combining convolutional neural network and bi-directional long short-term memory, is proposed for arrhythmia classification. Specifically, the classification comprises five different classes: non-ectopic (N), supraventricular ectopic (S), ventricular ectopic (V), fusion (F), and unknown (Q) beats. They combined the Bi-LSTM technique of size 32 based on factorial cross-entropy following the Adam optimizer with an evaluated optimum conv1D. The proposed model is trained, validated, and tested using MIT-BIH and St-Petersburg data sets separately. Also, the performance was measured in terms of precision, accuracy, recall, specificity, and f1-score. .The results show that the proposed model achieves training, validation, and testing accuracies of 100%, 98%, and 98%, respectively with the MIT-BIH data set.

**Author’s Name:**Swapna G, Soman KP, Vinayakumar R

**Year of Publishing:** 2018

**Description:**

A detailed study was done on the topic “Classification of ECG Heart arrhythmia”. Cardiac arrhythmia is a condition where heart beat is irregular. The goal in this paper is to apply deep learning techniques in the diagnosis of cardiac arrhythmia using ECG signals with minimal possible data pre-processing. They employed convolutional neural network (CNN), recurrent structures such as recurrent neural network (RNN), long short-term memory (LSTM) and gated recurrent unit (GRU) and hybrid of CNN and recurrent structures to automatically detect the abnormality. Unlike the conventional analysis methods, deep learning algorithms don't have feature extraction based analysis methods. The optimal parameters for deep learning techniques are chosen by conducting various trails of experiments.They obtained a validation accuracy of 83.4% in distinguishing normal and abnormal (cardiac arrhythmia) ECG with CNN-LSTM.

**Author’s Name:** [Sonain Jamil](https://pubmed.ncbi.nlm.nih.gov/?term=Jamil%20S%5BAuthor%5D) and [MuhibUr Rahman](https://pubmed.ncbi.nlm.nih.gov/?term=Rahman%20M%5BAuthor%5D)

**Year of Publishing:** 2022

**Description:**

In this paper,the author try to classify arrhythmia disorder with different approach by creating simpler image classifier using CNN 2D with smaller variety of input size that is smaller than state-the-art input and group the classes based on transformed ECG signal from MITBIH Arrhythmia database with the purpose to know what the most optimum input and the best accuracy to classify ECG signal image .The result of this research had produced an accuracy of up to 98.91% for 2 classes,98.10% for 7 classes,98.45% for 8 classes