PROJECT REPORT

APPLICATION OF CONVOLUTIONAL NEURAL NETWORK FOR CLASSIFICATION OF ELECTROCARDIOGRAM SIGNALS IN CARDIAC ANOMALY PRE-DIAGNOSIS

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ABSTRACT

A Convolutional Neural Network (CNN) model is proposed in this paper to categorize electrocardiogram (ECG) signals and identify arrhythmias. For feature extraction, the model uses PQRST parameters to classify ECG signals into four groups: Normal, Abnormal, Potentially Arrhythmia, and Highly Potential Arrhythmia. For multi-class classification, the CNN architecture consists of convolutional, pooling, and fully connected layers with ReLU and Softmax activations. Test results from 17 patients showed that the model had 92% accuracy, 93% precision, 92% recall, and 92% F1-score. The CNN model performs better in terms of accuracy and efficiency than traditional models like SVM and LSTM. Because the current results are affected by the limited sample size, future work will concentrate on integrating bigger, more varied datasets and conducting external validation to increase generalizability. This method has a lot of promise for real-time arrhythmia diagnosis, especially in environments with limited resources, like wearable technologies, which may allow for ongoing heart health monitoring and prompt management.

Keyword: Arrhythmia, Electrocardiogram, ECG signal analysis, PQRST parameters, Convolutional Neural Network