Heart Arrhythmia Detection using Wavelet Coherence and Firefly Algorithm

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Authors:

Padmavathi Kora, Ch. Usha Kumari, K. Meenakshi

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Abstract

Atrial Fibrillation (AF) is a common type of heart abnormality. During the AF electrical discharges in the atrium are rapid that results in irregular heart beat. The morphology of ECG changes due to the abnormalities in the heart. This paper consists of three major steps for the detection of heart diseases: signal pre-processing, feature extraction and classification. Feature extraction is the key process in detecting the heart abnormality. Most of the ECG detection systems depend on the time domain features for cardiac signal classification. In this paper we proposed a Wavelet Coherence (WTC) technique for ECG signal analysis. The WTC measures the similarity between two waveforms in frequency domain. Parameters extracted from WTC function is used as the features of the ECG signal. These features are optimized using Firefly algorithm (FFA). The optimized features from the FFA are given as the input to the Levenberg Marquardt Neural Network (LM NN) classifier. From the literature it is observed that the performance of the classifier is improved with the help of the optimized (reduced) features.

References


**Index Terms**

Computer Science  
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Keywords

ECG, Atrial Fibrillation, Wavelet Coherence, Firefly algorithm.