Abstract

Electrocardiogram (ECG), a non-invasive diagnostic technique, is used for detecting cardiac arrhythmia. For the last decade industry is dealing with Bio-medical instrumentation and research, demanding an advancement in its ability to distinguish different cardiac arrhythmia. Atrial Fibrillation (AF) is an irregular rhythm of the human heart. During AF, the atrial movements are quicker than the normal rate. As blood is not completely ejected out of atria, chances for the formation of blood clots in atrium. These abnormalities in the heart can be identified by the changes in the morphology of the ECG. The first step in the detection of AF is preprocessing of ECG, which removes noise using filters. Recent feature extraction methods, such as Auto Regressive (AR) modeling, Magnitude Squared Coherence (MSC) and Wavelet Coherence (WTC) using standard database (MIT-BIH), yielded a lot of features. Many of these features might be insignificant containing some redundant and non-discriminatory features that introduce computational burden and loss of performance. So Cuckoo Search Algorithm (CSA) is directly used to optimize the raw ECG instead of extracting features using the above feature extraction techniques. This paper proposes the design of an efficient system for classification
cardiac arrhythmia such as ANN (Artificial Neural Network), KNN (K-Nearest Neighbor), SVM (State Vector Machine). Our simulation results show that CSA with ANN gives 99.3% accuracy on MIT-BIH database by including NSR database also.

References

15. S. Parvaresh and A. Ayatollahi, “Automatic atrial fibrillation detection using


**Index Terms**

Computer Science

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**Keywords**

Atrial Fibrillation, ECG, Cuckoo search, Neural Network Classifier.