Abstract

Changes in the normal rhythm of a human heart may result in different cardiac arrhythmias, which may be immediately causes irreparable damage to the heart sustained over long periods of time. The ability to automatically identify arrhythmias from ECG recordings is important for clinical diagnosis and treatment. In this paper we proposed an Artificial Neural Network (ANN) based cardiac arrhythmia disease diagnosis system using standard 12 lead ECG signal recordings data. In this study, we are mainly interested in classifying disease in normal and abnormal classes. We have used UCI ECG signal data to train and test three different ANN models. In arrhythmia analysis, it is unavoidable that some attribute values of a person would be missing. Therefore we have replaced these missing attributes by closest column value of the concern class. ANN models are trained by static backpropagation algorithm with momentum learning rule to diagnose cardiac arrhythmia. The classification performance is evaluated using measures such as mean squared error (MSE), classification specificity, sensitivity, accuracy, receiver operating characteristics (ROC) and area under curve (AUC). Out of three different ANN models Multilayer perceptron ANN model have given very attractive classification results in terms of classification accuracy and sensitivity of 86.67% and 93.75%
respectively while Modular ANN have given 93.1% classification specificity

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Index Terms

Computer Science

Keywords

Accuracy  Ecg Arrhythmia  Multilayer Perceptron Neural Network Model  Momentum Learning Rule
Sensitivity
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