ABSTRACT

The condition of cardiac health is given by electrocardiogram (ECG). Electrocardiography deals with the electrical activity of the heart. There are many methods to identification of dysrhythmias such as digital filter IIR fuzzy logic classifier that it was researched. In this work, a study of the nonlinear dynamics of electrocardiogram (ECG) signals for dysrhythmias characterization was considered. The non linear dynamic analysis of the calculated features indicate that they differ significantly between normal heart rhythm and the different dysrhythmias types and hence, can be rather useful in ECG dysrhythmias detection. Non-linear parameters considered for cardiac dysrhythmias classification of the ECG signals are spectral entropy, poincaré plot and detrended fluctuation analysis which are extracted from heart rate signals. Dysrhythmias considered for the purpose of this study were classified into three categories, namely Normal Sinus Rhythm (NSR), Atrial Fibrillation (AF), Ventricular Fibrillation (VF). Recurrent Neural Network classifier was used for the classification and an accuracy of 90% was achieved.

Key words: elektrocardiogram, detrend fluctuation analysis, poincare plot, spectral entropy, recurrent neural network