ECG Arrhythmias Classification by Combined Feature Extraction Method and Neural Network

Khalooq Y. Al Azzawi
Electromechanical Engineering Department, University of Technology/ Baghdad
Email: kynal9@yahoo.com

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ABSTRACT
Electrocardiogram (ECG) became one of the most crucial tool for heart status diagnosis. Generally, several arrhythmias may appear based on different heart rate or ECG signal morphology variation. In this paper, a novel combined feature extraction method to present ECG arrhythmias is proposed. The combination between Wavelet Packet Transform (WPT) entropies and Power Spectrum Density (PSD) is suggested. For classification, Feed Forward Backpropagation Neural Network (FFBPN) is utilized. The experimental results showed that the proposed method can be beneficial for ECG signal arrhythmias classification. MIT-BIH Arrhythmia Database was used for algorithm testing. The proposed method was compared with three state of art methods, where was of better performance reached about 80%. The proposed method as well as other methods was tested in noisy environment for comparison investigations. The suggested method is promising approach for arrhythmias classification. However, enormous testing data set might significantly improve the results.

Keywords: ECG, Wavelet, PSD, Arrhythmia. FFBPN.