ABSTRACT

Arrhythmia is a disease of heart rate disorder. Lately, arrhythmia is considered as a serious disease because it might leads to death if not handled properly. This heart rate disorder can be diagnosed using electrocardiogram (ECG) procedures. Electrocardiogram is a diagnosing method used to observe the health condition of heart. There are many health systems that already adapt ECG for example, the classification of arrhythmia disorder using ECG.

The final assignment use Discrete Wavelet Transform (DWT) method and K-Nearest Neighbors classification (KNN). The extracted features of ECG signal from DWT method will be obtained as a wavelet forms of Daubechies, Symlets, Coiflets, and Biorthogonal. Meanwhile, KNN is used to classify the extracted features of ECG signals. The distance parameters that is used are Euclidean, Cosine, Cityblock, Minkowski, and Chebyshev.

The result of this research is a system that can detect and classify arrhythmia disorder with some scenario accuracy. The first testing scenario has the best accuracy of 99.71% in 8,52 seconds of computation time, obtained by using Bior4.4 wavelet, level 2 of decomposition using detail coefficient and Euclidean distance with K = 1. The second and third testing scenario is a combination of statical parameter, the highest value are mean, standard deviation, variance, skewness, kurtosis and entropy with 99.71% of accuracy in 8.52 seconds of computation time. The fourth testing scenario, is a testing scenario for every value of K which are 1, 3, 5, 7, and 9. The best K value is 1 with 99.71% of accuracy in 8.52 second computation time. The fifth scenario is testing scenario of distance parameters which are, Euclidean, Cosine, Cityblock, Chebychev, and minkowski. The best distance parameters is Euclidean with 99.71% of accuracy in 8.52 seconds of computation time.

Keywords: *Arrhythmias*, ECG, DWT, KNN.