Abstract

Congestive Heart Failure (CHF) is one of the deadly deseases in the world. CHF is a condition that occurs due to abnormalities in the heart muscles so the heart not able to pump the bloods according to the body needs.

Heart signals can be detected by performing an electrocardiogram record using a device, called Electrocardiography (ECG). Basically, a normal sinus rhythm has a similar shape. However, the ECG signals of CHF sufferers, varying in shape on each individual. It can cause problems if the extraction process is done manually using local features. Therefore, wavelet feature extraction is used in this study because of its ability to perform frequency mapping over time.

In addition, the classification process using the ANN Backpropagation Standard method requires a considerable amount of time to conduct the training process. Thus, the method of ANN Backpropagation with Modified Gradient Conjugate Polak-Ribiere with line search technique is proposed to speed up the searching process.

At the end of the study, the feature was obtained by using WPD at 5th level with 22 records of training data used. Gained an average value that is higher than the other trials that is equal to 72.5%. The most optimal number of neurons to be used in the hidden layer are as many as 30 neurons. Meanwhile, Charalambous' Search is the fastest and most accurate search technique to be applied to this case with a search time of 2.65 seconds, 14 epochs, and 87.5% accuracy.

Keywords: Heart failure, Wavelet, JST Backpropagation, Gradient Conjugate, Line Search