

## ABSTRACT

The heart is one of the important human organs that functions to pump blood throughout the body. The heart generates a series of electromagnetic heartbeats at various times. An electrocardiogram (ECG) is a graphic made by an electrocardiograph, which records the electrical activity of the heart over a period of time. Atrial fibrillation (AF) is an arrhythmia that can be caused by other conditions such as an overactive thyroid (adenoids) or excessive alcohol use. In this Final Project research, a feature extraction process is carried out using Discrete Wavelet Transform (DWT) and looks for the best algorithm for Feature Extraction with different wavelet basis functions such as Haar Wavelet (db1), Daubechies, and Symlet which are used to calculate the DWT coefficient. The results of the calculation of the wavelet basis coefficient are used as input to the Ensemble K-Nearest Neighbor (KNN) method at the classification stage. The test results that have been carried out show that the best feature extraction detection algorithm is Daubechies order 6 level 5 which produces the best performance with accuracy, sensitivity, and specificity values, namely 95%, 96%, and 100% specificity. The results of implementing the Daubechies Wavelet method prove that this method can be the best method for feature extraction.

**Keywords:** Heart, Atrial Fibrillation, ECG, Wavelet, K-NN