

## ABSTRACT

Heart disorders are a major health problem in developed and developing countries, one of which is Indonesia, such as heart attacks, strokes or heart failure. One million to two million deaths occur in heart patients each year and according to data from the Ministry of Health in 2010 that heart disease is the cause of death number one, patients in hospitals, the number reaches 35 to 100 thousand Indonesians every year. The cause of heart disorders itself is one of the hereditary factors but in the development era there are other factors such as lack of exercise or not eating healthy food.

So in this thesis will be designed a system that can detect heart abnormalities based on heart sounds with an electronic stethoscope using the fractal method and using the K-Nearest Neighbor algorithm. The functionality of the electronic stethoscope itself is similar to that of an acoustic stethoscope which allows recording the collected sound which will be easier to analyze using computer aids. Whereas the fractal method is a geometrical object obtained through an iterative process. And KNN is used to classify the sound characteristics of fractal method calculations such as box counting, sevcix, higuchi, and katz. Where the heart sounds will be heard or recorded through an electronic stethoscope and will then send the heart sound record data to the PC which will be displayed with the Matlab application.

The results of this thesis is a system that is able to detect heart abnormalities and classify with the accuracy of some test data. In testing B training and F training with factorial methods and KNN algorithm is able to calculate the value of accuracy. The parameters used in fractals are Box Counting, Katz, Higuchi, and Sevcix with a value of  $K = 1$  or odd, the best parameter is Katz Method with an accuracy value of 72 %.

Keywords: Heart Disorders, Electronic Stethoscope, KNN and Fractal