

Abstract

CAD is a cardiac disorder in which a plaque develops in the interior wall of the arteries resulting in blockage of blood reaching to the heart muscles. Many studies have made a diagnosis of CAD disease, one of which is the use of machine learning to make a diagnosis quickly and relatively cheaper in CAD disease. However, the dataset used and the accuracy generated using machine learning in research to diagnose CAD is still not optimal. This study provides a solution to this problem by building a prototype with a digital stethoscope sensor using a machine learning classification algorithm to diagnose CAD disease of the four heart valves, namely the aortic, mitral, tricuspid and pulmonary. To get maximum results, this study conducted a classification algorithm study, namely Naïve Bayes(NB), Support Vector Machine(SVM) and K-Nearest Neighbor(KNN) to find the best algorithm that can be used for CAD diagnosis in ultrasound signal data. The addition of the preprocessing, wavelete and feature extraction processes is done in order to improve accuracy. Feature extractions used in this study are the mean, median, standard deviation, skewness and kurtosis. And also 5-fold Cross Validation is implemented in the classification system to get the most optimal accuracy. The results of the accuracy of the three machine learning used in this study get the highest accuracy of 76% using the Naïve Bayes algorithm which is performed on the mitral valve with 80% sensitivity and 73,4% sensitivity. SVM and KNN algorithms also get an accuracy of 66% in the type of aortic heart valve.

Keywords : coronary artery disease, machine learning, sthetoscope, heart