ABSTRACT

Coronary Artery Disease (CAD) is the most prevalent type of heart disease. This disease is caused by the hardening and narrowing of the arteries that supply blood to the heart muscle. Researchers have previously conducted research for this rapid diagnosis of CAD by observing signals in heart sounds using a digital stethoscope, which is considered a quick and easy way to apply. However, there are several gaps in signal analytics for this diagnosis, as a consequence in which the final outcomes and accuracy obtained are less than acceptable. This study conducts a function extraction algorithm study on the phonocardiogram signal to get a more solution to this problem. The function extraction algorithm is a key element of ensuring best results. Entropy, strength, and time domain are amongst the elements used in CAD diagnosis. This study employs Naive Bayes as a CAD feature data classifier to distinguish between normal and CAD data classes. K-Fold Cross Validation with K=5 is used to find the best machine learning model after collecting training data. During the pre-processing stage, denoising will be performed to reduce noise in the heart sound and thus improve the resulting accuracy. Three feature-based experimental scenarios derived from the three selected feature extraction algorithms were created to achieve optimal detection accuracy. In the first scenario, feature data from a single algorithm, such as Shannon Entropy, Shannon Energy, or Time Domain Only, is used. The second scenario involves the collaboration of the two selected algorithms, while the third involves the merger of the three selected algorithms. The testing findings in a single algorithm scenario prove that the time domain algorithm is the best algorithm, with 86% accuracy, 100% sensitivity, and 66.6 percent specificity.

Keywords : ***coronary artery disease, feature extraction, phonocardiogram***