

## **ABSTRACT**

*In 2018, 17.9 million people died from heart disease. Electrocardiogram is one of the methods used to diagnose heart conditions, but this method is quite expensive, so the phonocardiogram is chosen as an alternative. Phonocardiogram has the advantage of being noninvasive and cost-effective compared to electrocardiogram. However, the use of PCG as a diagnostic tool requires complex signal analysis. The purpose of this study is to develop a classification device as a diagnostic tool based on the Short Time Fourier Transform method as feature extraction and Support Vector Machine as a classification of heart conditions. The performance of the system is designed using a secondary dataset, with a total of 2,141 signals consisting of 1958 normal and 183 abnormal. Performance testing uses several variations, namely Hamming, Hanning, and Blackman window on STFT and kernel variations and the value of C parameter on SVM. Based on the test results on the feature extraction process, the best value was obtained by Hamming Window with a sensitivity value of 62.24%, specificity 89.47%, Area Under ROC Curve 0.75, and an accuracy of 65.62%. The results of the best classification process are obtained in the Radial Basis Function kernel with a variation of the value of  $C=1000$  with an AUC value of 0.83 and an accuracy of 72.4%. This study proves that the use of the Hamming window, the value of  $C=1000$ , and the RBF kernel is the best form of the PCG system based on STFT and SVM.*

**Keywords:** *heart disease, PCG, extraction, STFT, classification, SVM.*