

## ABSTRACT

*Parkinson's disease can not be cured because there is no medicine. People with Parkinson's disease also cannot be diagnosed when symptoms begin to appear through brain scanning technology such as magnetic resonance imaging (MRI) because the results still looks normaltherefore, it is needed a method to be able to diagnose people with Parkinson's early even though it still looks normal. The results of the diagnosis of people with Parkinson's disease can be seen by the symptoms that appear and anticipate the prevention of Parkinson's disease so that it does not develop into a serious condition after the patient is diagnosed.*

*This study classifies the recorded data signal generated by the Vertical Ground Reaction Force (VGRF) sensor sourced from the Physiobank database. VGRF sensors totaling 16 sensors are installed on the feet when walking. This study designed a system that can detect the symptoms of Parkinson's disease through signal data recording using a comparison of the Wavelet Packet Decomposition (WPD) method with Principal Component Analysis (PCA) combined with Compressive Sensing (CS) and the classification used is K-Nearest Neighbor (KNN).*

*This study uses 191 data, 96 training data and 95 training data used in the feature extraction scenario (wavelet packet decomposition and principal component analysis) combined with compressive sensing L1-magic reconstruction and k-nearest neighbor classification. The best performance for wavelet is achieved using several parameters, with mother wavelet coiflets (coif1), decomposition level 4, cs 80% and  $K = 5$  achieves classification accuracy of 92.75% with a time of 186 seconds. While the best performance of principal component analysis is achieved using several parameters, namely cs 20%, and  $K = 5$  achieves classification accuracy of 70.52% in 131 seconds. The results of this study can reduce the number of Parkinson's disease because it can diagnose symptoms early, so patients can take precautions to reduce the incidence of Parkinson's disease.*

*Keywords: Parkinson, WPD, PCA, CS, KNN*