

ABSTRACT

Parkinson's Disease (PD) cannot be diagnosed by a medical image when the initial symptoms appear because brain scans technology using computed tomography and magnetic resonance imaging for PD symptoms looks normal. Therefore, it is needed an analytical method that can be used for early PD diagnostics even though people with PD still looks normal. So medical experts and PD researchers suggest inter-science collaboration for PD research to be effective. The diagnosis of PD by looking at the initial symptoms is the best possibility that can be done to prevent gradual bereavement after the patient is diagnosed.

Patients with PD not only have symptoms of shakiness and stiffness but also have movement disorder and loss of balance. Thus, this research is done by classifying the record of signals which generated by the vertical ground reaction force (VGRF) sensor from the Physiobank database. The VGRF sensor totals 16 sensors mounted on the feet during walking in order to diagnose PD through a gait analysis by combining the wavelet coefficients of the VGRF signal decomposition results and classified using the support vector machine (SVM).

This study shows that the wavelet coefficient is a good feature for representing VGRF signals. The SVM on 140 training vectors and 139 testing vectors achieves classification accuracy of 81,29% with 80,87 seconds on central processing unit (CPU) time, then this method can be considered for the gait analysis based on VGRF signal recording. This study can slow the progression of PD disease because the diagnosis is done early and provide an opportunity for medical experts to put on treatment recommendations after people diagnosed as PD sufferer.

Keywords: Parkinson's Disease, Vertical Grond Reaction Force, Wavelet, Support Vector Machine, Gait Analysis.