BE018

Gait Monitoring and Analysis of Parkinson's Disease Patients

PROJECT ABSTRACT

Parkinson's disease (PD) is a neurodegenerative disorder that affects the dopamine producing neurons in the substantia nigra, an area of the brain, leading to shaking, stiffness and difficulty walking. Parkinson's patients frequently exhibit the debilitating condition freezing of gait (FOG), which is when patients cannot move their feet forward despite the intention to walk. While the feet remain in place, the torso still has forward momentum, making falls very common. Several studies have reported methodologies to identify the PD patients at an early stage. The purpose of this project was to identify the parameter which is most suitable for classification of FOG in PD patients. IMUs, machine learning algorithms and gait parameters have been investigated. An algorithm has been developed to analyze the Public datasets of PD patients in order to extract the motion pattern of PD patients. Based on the analysis results, a combination of Freeze Index values is postulated and used to predict FOG based on these parameters. Ultimately, a prototype that fulfils all these requirements was created based on acceleration data from accelerometers placed on the thigh.