Development of a Muscle Rigidity Measurement System for an Early Diagnosis of Parkinson's Disease

Lee, Hyeongkeun

Yun, Sangjin

Parkinson’s disease is a chronic progressive degenerative neuro-disease. About 90% of patients with Parkinson’s disease die within 15 years. Since its symptoms become worse as time passes and more diverse treatments are available at an early stage, it is necessary to diagnose Parkinson’s disease as early as possible. Increase of muscle rigidity is a major symptom noticed in 90% of patients and can be used to diagnose Parkinson’s disease. This muscle rigidity can be determined by subjecting the hand under passive force. So far, previous apparatuses need motors or intervention of the third person. Among those, which use motors, lack in portability and cost are much of a concern. Others requiring third person intervention are unable to provide stable passive force and self-diagnosis of Parkinson’s disease. In this research, we introduce ‘Wrist Smartone’ that measures the muscle rigidity of the wrist. ‘Wrist Smartone’ uses compressed spring to provide passive force. Therefore, ‘Wrist Smartone’ is relatively cheap and enables self-diagnosis. Since it is very easy to adjust the strength of the compressed spring and the range of rotation, it can be adapted to various situations. The evaluation results of its accuracy show that ‘Wrist Smartone’ gives similar outcomes as those of previous researches and definitely differentiates the normal wrist and the stiff wrist.

Awards Won:

Fourth Award of $500