

Development of a Wrist Rehabilitation Device with Android-based Game Application

Abstract

Traditional methods of rehabilitation that lacking excitement can contribute to demotivate patients in completing rehabilitation. Thus, interactive and interesting rehabilitation methods are essential to ensure stroke patients continue rehabilitation activity. This project proposes a wireless home based wrist rehabilitation device with an android-based game application (app). The patients will be able to do wrist therapy at home or anywhere with the rehabilitation device. The device is consists of an accelerometer that can measure acceleration in three dimensional space. It is developed in free wrist movement such as roll, pitch and yaw. The accelerometer data is processed by an Arduino Micro, and converted into mouse cursor movement that can be used in an android-based game app for rehabilitation. The game app called "BallGame" is being developed using the MIT App Inventor software. In this work, the hardware development of the rehabilitation device is presented. Furthermore, early development stages of the game app is described where the data from the rehabilitation device is successfully transmitted to the app via Bluetooth communication.