Final Abstract

Team 3: Mobile Application for Post Stroke Gait Analysis

Stroke victims often suffer from the inability to fully control their muscle movements. In fact, stroke is the leading cause of mobility impairment and prolonged disability in the United States. The issue is worsened since patients are limited in how they interact with their doctors, and when they do, the tests performed are often subjective and qualitative. Elderly patients and those living in inaccessible regions are especially disadvantaged by lower frequency of clinic visits, which further restricts timely therapeutic interventions. If, however, doctors could quantitatively monitor a patient's movement profiles remotely, they could gauge their rehabilitative progress and adapt their treatment plans as needed, in an informed manner. Unfortunately, there is currently no solution on the market that fully addresses this need. Failure to resolve this issue results in unnecessarily prolonged treatments, delayed recovery, increased costs, and lower quality of life. Thus, our team has designed a mobile application to collect and analyze gait patterns from the convenience of the patient's own home. Using a combination of wearable bluetooth sensors, patients can track their routine movements with the touch of a button, while our program runs on the background of their personal Android device. The recordings are then saved locally and securely stored in the cloud. Patients can then choose to share data with their physician, who can in turn access quantified metrics relevant to the patient's stability and propensity of falls - such as their step duration, regularity, and symmetry. Doctors can translate this information into more accurate and prompt adjustments to the patient's plan of care. Hence, our solution empowers doctors and patients to make optimal healthcare choices and enables high quality of care to all patients regardless of age and access to reliable transportation.