

Title:

Lower Limb Rehabilitation Equipment With Animation Performance For Isotonic And Isokinetic Exercises

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Abstract:

Lower limb rehabilitation as assisted by physiotherapists plays an important role for post-stroke recovery to help patient to regain body movement, gait and speech capabilities in which the rehabilitation process is performed at the hospital or rehabilitation centre. However, transporting the patients to such places for scheduled appointments would increase the overall cost and become unfavourable. Therefore, a prototype of portable home-based lower limb rehabilitation equipment is developed in this paper that is able to analyse the human muscle contraction during rehabilitation session and interpret the patient's progress in terms of animation performance scoring. Specifically, the developed rehabilitation equipment consists of an actuator for lower limb flexion and extension activities in which three electromyogram (EMG) electrodes are patched on the rectus femoris muscle for muscle contraction signal reading during the rehabilitation procedure. This project used Arduino as the microcontroller to collect the muscle contraction signal and interpret them in terms of animation to visualize the patient's progress. The assimilation test performed to a normal individual showed that the developed rehabilitation equipment has successfully collected vigorous muscle contraction during rehabilitation procedure of lower limb and visualized the performance-based index of the muscle progress via animation.

Remark

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