

EMG Based Orthosis for Upper Limb Rehabilitation in Hemiparesis Patients

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Abstract : Hemiparesis affects almost 80% of stroke patients each year. It is marked by paralysis or weakness on one half of the body. Our model provides both assistance and physical therapy for hemiparesis patients for swift recovery. In order to accomplish our goal a force is provided that pulls the forearm up (as in flexing the arm), and pushes the forearm down (as in extending the arm), which will also assist the user during ADL (Activities of Daily Living). The model consists of a mechanical component which is placed around the patient's bicep and an EMG control circuit to assist patients in daily activities, which makes it affordable and easy to use. In order to enhance the neuromuscular system's effectiveness in synchronize the movement, proprioceptive neuromuscular facilitation (PNF) concept is used. The EMG signals are acquired from the unaffected arm as an input to drive the orthosis. This way the patient is invigorated to use the orthosis for regular exercise.

Keywords : EMG, hemiparesis, orthosis, rehabilitation

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