



Modeling and Control of an Exoskeleton Robot for Rehabilitating Shoulder, Elbow and Wrist Joints

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In order to perform daily living activities, the movements of shoulder, elbow and wrist joints are necessary. So, in this paper an exoskeleton robot with 3 degrees of freedom has been suggested to rehabilitate the shoulder, elbow and wrist joints. Euler-Lagrange method is used to dynamic modeling of the proposed robot. Dynamic parameters of robot such as mass, inertia and length have been selected according to the physical characteristics of an adult. As the performance of such systems relate to the effects of force and pressure on human musculoskeletal system, impedance control method in joint space is proposed. Simulation results show the high performance of the proposed method to perform the therapist's desired motions for rehabilitating the patients.