

عنوان مقاله:

Online Usage of Biomechanical and Simulation Software in Analysis of the Performances of Rehabilitation Robots,
Using Simulation Technique

محل انتشار:

مجله پژوهش در علوم توانبخشی، دوره 15، شماره 2 (سال: 1398)

تعداد صفحات اصل مقاله: 7

نویسندگان:

مریم خمر - *PhD in Control Field, Department of Electrical Engineering, School of Engineering, University of Isfahan, Isfahan, Iran*

مهدی ادریسی - *Assistant Professor, Department of Electrical Engineering, School of Engineering, University of Isfahan, Isfahan, Iran*

سعید فرقانی - *Associate Professor, Department of Orthoses and prostheses, School of Rehabilitation Sciences, Isfahan University of Medical Sciences, Isfahan, Iran*

خلاصه مقاله:

Introduction: Rehabilitation robots have the ability to assist the patients with paralysis and semi-paralysis. Besides, these robots are capable of being programmed to perform various rehabilitation methods. However, evaluating their functions and their effects on human's body are still two of the main challenges of these robots. The purpose of the present study was to introduce a method for assessing the function of a rehabilitation robot in modifying the crouch gait to normal gait, by using online biomechanics and computational software. **Materials and Methods:** Rehabilitation robot and human leg were simulated using Inventor (Autodesk, Inc.) and OpenSim (Stanford University) software. User's muscle strength was calculated according to a crouch gait. The system got the position of each joint and muscle strength as input, and determined the torque required for each hip and knee joints. **Results:** The performance of rehabilitation robot on human body was evaluated by relating the simulation in biomechanical and computational software. The kinematic and kinetic effects of robots on model of human model with crouch gait pattern was confirmed. In addition, the error of tracking normal gait with wearable robot was less than 0.06 rad for user with crouch gait. **Conclusion:** By using a simulation method and analyzing the motion data of a person gait pattern, an optimal path can be defined individually for each person, which reduces the risk and error of tracking while using the rehabilitation robot. It is also possible to change the mechanical and control structure of wearable robots in simulation without the cost and risk of laboratory evaluation.

کلمات کلیدی:

Wearable Robot, OpenSim Software, Teaching in walk cycle

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1592788>



