

عنوان مقاله:

Dynamic Analysis for Exoskeletal Assisted Waking of a Paraplegic Patient

محل انتشار:

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نویسنده:

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خلاصه مقاله:

The study introduces a new dynamic analysis framework for studying human-robot interaction control in exoskeletal robotic units. The coordinated movements of humans and robots create complex interactions that need careful management for safety and comfort. The bond graph approach is recommended to create an accurate dynamic interaction model of the lower extremity human-exoskeleton system, reducing computational efforts compared to traditional methods. The resulting system of differential equations can be used in dynamic simulations with Simulink software in MATLAB. A computer model of the neuro-musculoskeletal-exoskeleton system was developed and integrated with the Virtual Reality toolbox of MATLAB for visualization. The simulation using impedance control for a paraplegic patient-exoskeleton system showed promising results with joint kinematics closely matching experimental data and safe interaction forces. This framework allows for efficient modeling and optimization of exoskeleton systems for individuals with mobility impairments.

کلمات کلیدی:

human-robot, lower extremity exoskeleton, bond graph, interaction, musculoskeletal

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