عنوان مقاله:

Reinforcement Learning-Based Control for Robot-Assisted Rehabilitation

محل انتشار:

هشتمین همایش بین المللی علوم و تکنولوژی با رویکرد توسعه پایدار (سال: 1402)

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خلاصه مقاله:

This article introduces a novel approach to designing a reinforcement learning-based control system for robot-assisted rehabilitation. Unlike traditional rehabilitation methods where therapists manually guide patients through exercises, our system employs intelligent agents, specifically reinforcement learning, to autonomously assist individuals in their rehabilitation journey. The focus of this study is on the rehabilitation of hand muscles using a robotic exoskeleton. Patients follow a desired path based on visual feedback displayed on a monitor, while the reinforcement learning control acts as an intelligent therapist, intervening when the patient deviates from the correct trajectory. The control mechanism is model-free, relying solely on information exchange between the agent and the environment for learning. Q-learning is employed as the core algorithm in this scenario, showcasing its effectiveness in facilitating smart therapy sessions.

کلمات کلیدی:

Rehabilitation Robotics; Reinforcement Learning; Game Theory; Model-Free Control; Smart Therapy