

Optimization of the Control Scheme for Human Extremity Exoskeleton

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Abstract : In order to design a suitable control scheme for human extremity exoskeleton, the interaction force control scheme with traditional PI controller was presented, and the simulation study of the electromechanical system of the human extremity exoskeleton was carried out by using a MATLAB/Simulink module. By analyzing the simulation calculation results, it was shown that the traditional PI controller is not very suitable for every movement speed of human body. So, at last the fuzzy self-adaptive PI controller was presented to solve this problem. Eventually, the superiority and feasibility of the fuzzy self-adaptive PI controller was proved by the simulation results and experimental results.

Keywords : human extremity exoskeleton, interaction force control scheme, simulation study, fuzzy self-adaptive pi controller, man-machine coordinated walking, bear payload

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