STATICALLY STABLE WALKING SIMULATION AND POSTURE CONTROL FOR A MOBILE WHEELCHAIR ROBOT

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ABSTRACT

OWING TO THE DEVELOPMENT OF MEDICAL TREATMENT, THE HUMAN'S AVERAGE LIFESPAN INCREASES AND DEATH RATE REDUCES DRASTICALLY. THEREFORE,THE SOCIETY GRADUALLY BECOMES AN ADVANCED AGED ONE SUCH THAT IT RESULTS IN MANY PROBLEMS LIKE DISABILITY, CHRONIC AILMENT,AND MED -ICAL TREATMENT OF THE AGED.FOR NOW, WHEELCHAIRS FOR THE DISABLE USUALLY NAVIGATE ON EVEN TERRAIN. HOWEVER,THEY HAVE QUITE LIMITATIONS OF ACTIVITIES IN SOME TERRAIN,AND CAUSE MANY INCONVENIENCE.BASED ON A NEW MECHANISMDEVELOPED IN OUR LABORATORY IS A POTENTIAL FOR WHEE -LCHAIRS,THE MOBILE WHEELCHAIR ROBOT CAN SURMOUNT OBSTACLES SUCH AS STAIRWAY.THEREFORE,THE RESEARCH IS FOCUSED ON THE DERIVATION OF THE EQUATIONS OF MOTION FOR THE WHEELCHAIR ROBOT USING LAGRANGIAN FORMULATION. SIMULATIONS FOR STATICALLY STABLE WALKING MANEUVERS VALIDATE THE SAFETY AND FEASIBILITY OF THE MOBILE WHEELCHAIR ROBOT.FINALLY,A PATH TRACKING CONTROL IS DEVELOPED TO LET MOBILE WHEELCHAIR ROBOT FOLLOW THE DESIRED TRAJECTORY.

Keywords: MOBILE WHEELCHAIR ROBOT, STATICALLY STABLE WALKING,POSTURE, LAGRANGIAN

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