

Application of Joystick in Electric Wheelchair

The wheelchair is very useful for physically handicapped people. The powered wheelchair can be designed by using robotics and intelligent system technologies. The joystick control wheelchair is very easy to operate. By using the joystick the physically challenged person can control the movement of wheelchair. In this application, the microcontroller is employed to monitor and control the system.

Working of Wheelchair :

Initially joystick is moved to exact middle position. Till the joystick is kept at middle position the motor will be in stop condition. When the joystick is moved the potentiometer encodes analog voltage values and transfers it to the Arduino board through the analog data pin. The Arduino take these analog values and send it to an ADC (Analog to Digital Converter).The ADC convert the analog value to digital signal. In its common mode of operation, two DC motors can be driven simultaneously, both in forward or reverse and right or left direction. As joystick is slightly turned forward the voltage input at ADC increases and the motor starts rotating in forward direction. Thus ,the motors moves forward or reverse and right & left as the pot is turned forward or reverse and right or left. To implement these functionalities a software program is embedded into micro controller. The two DC motors are controlled by motor drivers and Arduino according to the instruction of the Joystick. The command is implemented by using joystick and then the command is sent to the microcontroller where the controller executes the command. After executing, the controller send the command in the form of digital signal to the motor driver that controls the movement of the two DC motors. Thus the DC motor rotates according to the command of the joystick.

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