HAND GESTURE CONTROLLED WHEEL CHAIR

ABSTRACT

This project is to develop a wheelchair for physically disabled people
The wheel chair is controlled by hand movement/hand gestures
The gestures are recognized by an accelerometer sensor
An ultrasonic sensor is used to detect the obstacles in front of the chair
The signals from the sensors are processed, and the wheelchair is
controlled by a microcontroller.

INTRODUCTION

1. Wheelchairs are the best assistive device used by elder and disabled people.
2. The driving and controlling of traditional wheelchairs are much harder tasks.
3. Our aim is to build a low cost and powerful wheelchair which helps the handicapped people to travel without depending on others.
4. Introducing a prototype of cost effective electronic gesture based wheel chair Easy to operate, because this wheelchair can operated even by a user without palm

Components

Micro controller :-

Accelerometer Sensor :-

1. Accelerometer sensor is used to recognize the hand gestures
2. It recognizes the acceleration(tilting) of the hand in both X and Y-axes
3. It produces different numerical values corresponding to the direction of acceleration

Ultrasonic Sensor

1. Ultrasonic sensor is used to sense the obstacle in front of the chair.
2. It calculates the distance by producing ultrasonic waves.
3. It has an ultrasonic transmitter and a receiver
4. The distance is calculated using the expression
5. distance=(duration/2)*.034
   Where , duration : the time interval between transmission and reception
   0.034 is the speed of sound in centimeter per microseconds.
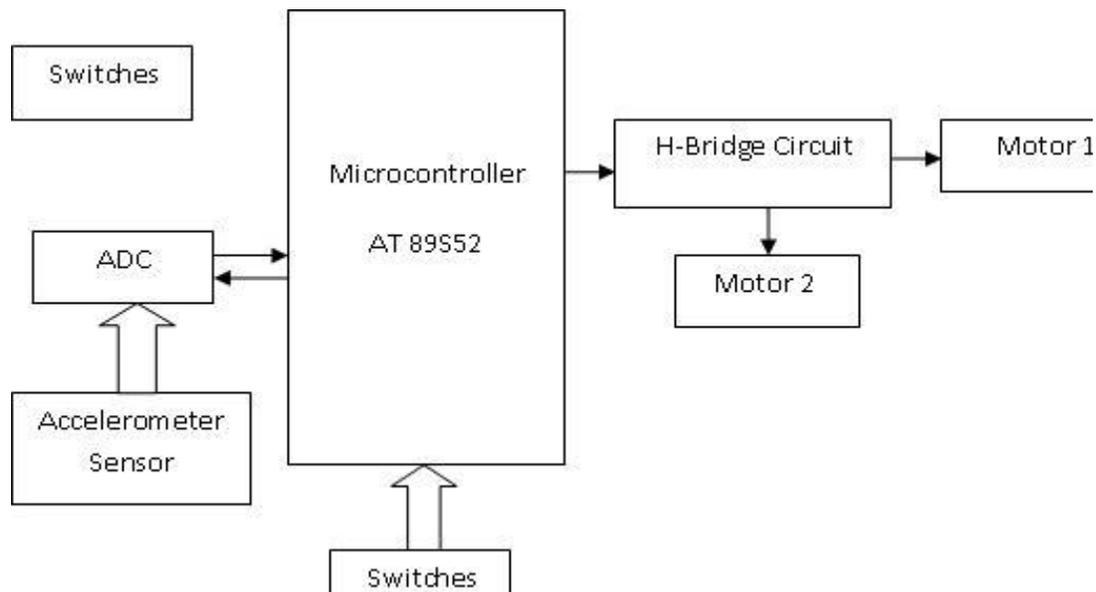
Motor Driver &   DC Motor

1. The L293D is a 16-pin IC with 8 pins on each side
2. It is dedicated to the controlling of a motor
3. An L293D can control 2 motors simultaneously
4. 2 input pins,2 output pins and 1 enable pin for each motor

INPUT

INPUT

MOTOR

GND

L293D

GND

MOTOR

INPUT

INPUT

Power Supply
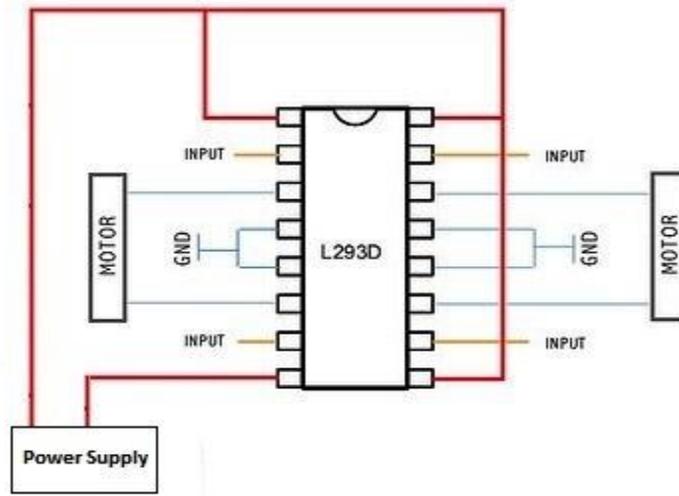
Block Diagram

FUTURE SCOPE

1. Automated wheel chair can be operated by a wireless remote which can reduce the wiring arrangements
2. Instead of using acceleration motion we can use eye retina using optical sensor to move wheelchair accordingly
3. We can use voice command IC's to interface our voice signal with microcontroller
4. This system can be extended by including GSM which sends an SMS during emergency Research are going on development of handicap wheelchair using nervous system of human
5. It may also include wireless wearable controller or even a joystick mounted on armrest or even both