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AUTOMATIC WHEELCHAIR USING FLEX SENSOR

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ABSTRACT-

For the people with physical disability , sickness or injury in their legs, wheelchairs are designed to ease their mobility and to provide them with proper moving technology. This paper describes an intelligent motorized wheelchair for physically handicapped people using flex sensor technology. Such a wheelchair helps physically handicapped people to navigate without the help of any other individual. It consists of a FLEX SENSOR connected to an Arduino which drives the motor in the desired direction of the operator. To drive the wheelchair we use flex commands like forward, backward, left and right to take it in their respective directions. These directions are controlled by the command valid through Flex Sensor. FLEX SENSOR produces analog signal i.e, its resistance increases or decreases depending on the direction of bend which is given to the Arduino, the Arduino converts three analog signals into digital using the inbuilt ADC, therefore different ADC values are obtained with different touch positions. Depending on the angle and direction of bend corresponding ADC values are calculated by arduino and the motor moves in the desired direction.

KEYWORDS–Wheelchair, Flex sensor, Arduino Uno, DC motors, Motor drivers L293D, Power supply and IR Sensor

I. INTRODUCTION

Driving a wheelchair in day to day life is difficult and becomes even more difficult for a person with physical disability. Some people with arms disability cannot navigate the wheelchair in the desired direction. Therefore Automatic wheelchair is developed to solve the problem for navigation and safe movement in the desired direction. Different input methods can be used to perform task. In this wheelchair, we are using Flex Sensor command for the mobility in desired direction. Since Automatic wheelchair can gain speed which may not be required. So, we need to control the speed of the wheelchair. So, to control the speed of the wheelchair we use PWM method. Four Flex Sensor is used for the movement in forward, backward, left and right direction. Also an IR sensor is used to detect any hindrance that comes in between. A crystal Oscillator is used to give clock

signal and dc motor drivers are used to rotate the dc motor in the desired orientation. And an Arduino is used to control the entire circuit..

II. LITERATURE REVIEW

NAME SR.NO	TOPIC	AUTHOR NAME	YEAR OF PUBLICATION	METHODOLOGY USED
1.	Speech controlled Wheelchair for physically disabled person	Final year students, Lecturer, Department of Instrumentation Technology, Basaveshwar Engineering College, Bagalkot, Karnataka, India-586709	Oct 2013	To drive the wheelchair we are using speech commands "forward, backward, maximum, medium, minimum and stop
2.	Accelerometer Control of a Smart Wheelchair for the Automated Transport and Retrieval System	DheerajPongallu	December 2014	The wheelchair was moved using an accelerometer.
3.	Automation wheelchair using eyeball sensor	Sagar T. Payghan1	March 2016	Wheelchair moved with the movement of the eyeball.

III. METHODOLOGY

PROPOSED METHODOLOGY:

1. Four Flex Sensor is used as input device to navigate the Automatic wheelchair in different directions. FLEX SENSOR produces analog signal i.e, its resistance increases or decreases depending on the direction of bend which is given to the Arduino.
2. The Arduino converts three analog signals into digital using the inbuilt ADC, therefore different ADC values are obtained with different touch positions.
3. This command is passed on to the DC motors driver which in turn rotates the DC motor(wheel) and the mobility of the wheelchair is observed.
4. A crystal Oscillator is used to give clocksignal.
5. An IR sensor is used to detect any obstacle that comes in between.

6. All these components are connected to the Arduino which need DC input to operate

BLOCK DIAGRAM

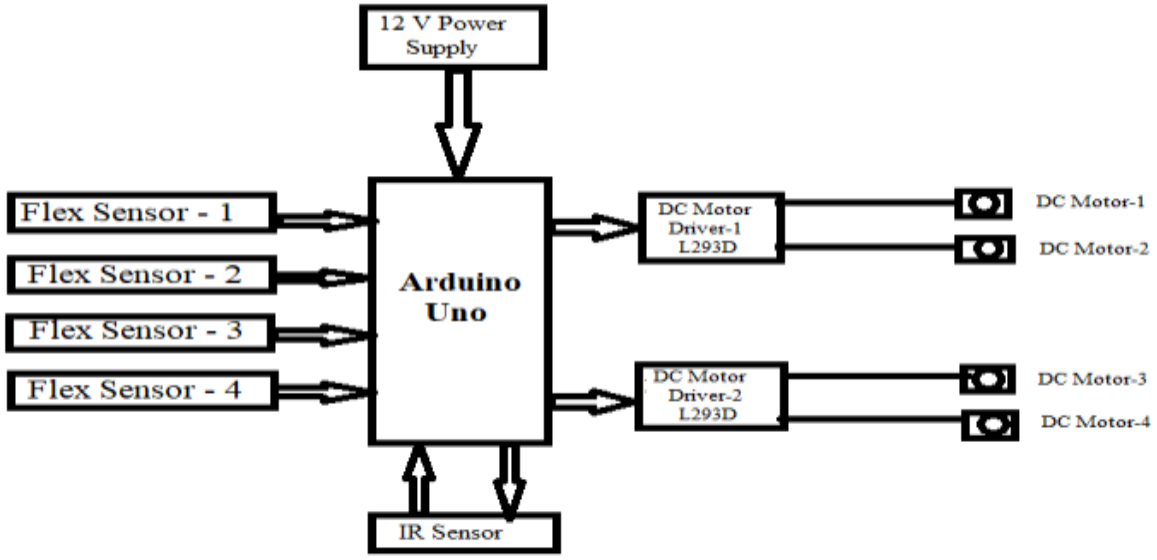

Fig.No.1AUTOMATIC WHEELCHAIR USING FLEX SENSOR

IV. COMPONENTS USED TO IMPLEMENT THE IDEA

1. ARDUINO UNO
2. FLEX SENSOR
3. DC MOTOR DRIVER L293D
4. DC MOTOR
5. IR SENSOR
6. BATTERY
7. BALL BEARING

V. MODEL OF AUTOMATIC WHEELCHAIR USING FLEX SENSOR

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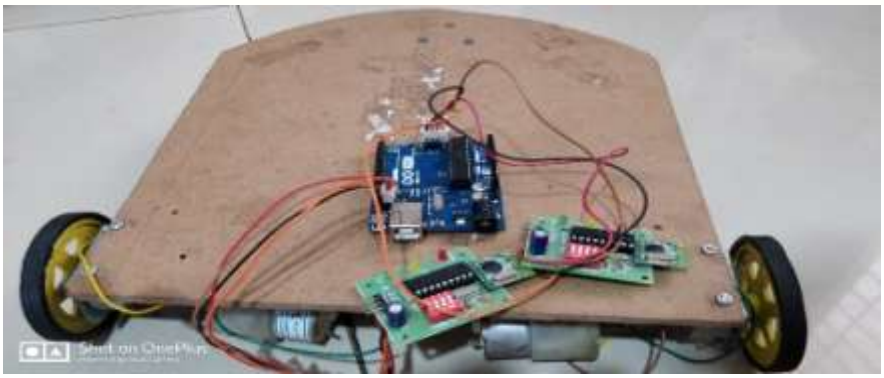

fig. MODEL OF AUTOMATIC WHEELCHAIR USING FLEX SENSOR

VI. ADVANTAGES

1. Minimal effort is needed to control the wheelchair because you use a simple Flex Sensor.
2. Easy to move from one place to another place.
3. Operating principle is very simple.
4. Non-skilled person can also operate this machine.
5. It is economical.

VII. APPLICATIONS

1. A wheelchair itself is an application, but to add on this we could connect a Flex Sensor to the same and can allow operation using a Flex Sensor. For example, instead of giving the movement commands by joystick we could create a Flex Sensor to control the movement.
2. Another addition to this could be a Bluetooth application to control the movement but this could add delay in transmission thus, increasing danger to the life of the person on it.
3. Also the same kind of idea can be used in designing Hi-Tech games,for kids. For example, in movement of mini cars and jeeps.

VIII. CONCLUSION

Thus we can say that as per the bending of the Flex Sensor, the wheel move. Four Flex Sensor allows the wheelchair to move in forward, backward, left and right directions and the crystal oscillator gives clock input and DC motor driver L293D drives the DC motor(wheel) in return thus, giving the wheelchair a movement.

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IX. REFERENCES

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