

ACCELEROMETER OPERATED WHEELCHAIR FOR PHYSICALLY CHALLENGED PERSON

Puneeth kumar G B¹, Vandana H K², Vidya B R³, Archana B M⁴, Pooja M⁵

Assistant professor, Dept. of ECE, BGSIT, Mandya.¹

Student, Dept. of ECE, BGSIT, Mandya.²

Student, Dept. of ECE, BGSIT, Mandya.³

Student, Dept. of ECE, BGSIT, Mandya.⁴

Student, Dept. of ECE, BGSIT, Mandya.⁵

ABSTARCT: This project is on automatic wheelchair for physically disabled people. A dependent user recognition accelerometer sensor has been integrated in this wheelchair. The wheelchair has also been developed to work on movement of accelerometer which will help for the person whose limbs are not working. Accelerometer can be attached to any part of the body of physically disabled person which he can easily move like head, hand etc. Electronic system configuration, a sensor system, a mechanical model voice recognition control and accelerometer control.

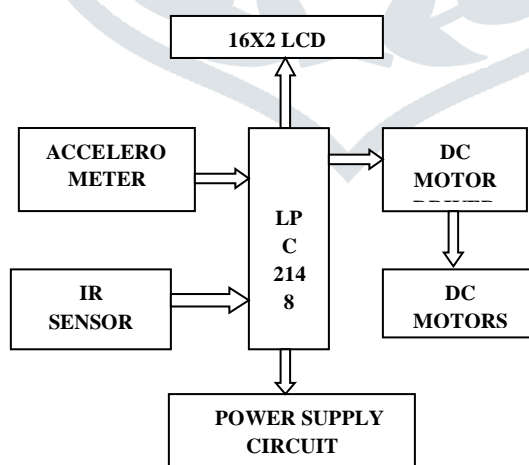
KEYWORDS: Accelerometer, IR sensor, LCD display, DC Motor

I. INTRODUCTION

Some handicaps are not able to handle the wheelchair because they are not having both legs and hands. So they would not able to take a help of wheelchair also but our equipment (device) accelerometer operated wheelchair will support them, the particular handicap will himself operate his own wheelchair and moves it in any direction. There is no need other person to be with him as a helper. Here wheelchair is being directionally controlled through the head tilt activating programmed accelerometer type head switch. Evan's arms become very tight during motor movements, which make using as stressful and barely manageable. These devices can ease the lives of many disabled people, particularly those with serve impairments by increasing their range of mobility.

For handicapped people human found a wheelchair which can be moved by using head tilt for those don't have hand and legs. But the people who don't have legs as well as hands can move their wheelchair self. They need some other person to move their wheelchair. But sometimes such person faces so many problems if they didn't get any persons to move their wheelchair.

FUNCTIONAL BLOCK



WORKING:

Accelerometer is a device which is used for measuring the acceleration and the tilt angle of anybody over which it is mounted. The output of an accelerometer IC is in terms of variable voltage linear to the acceleration or the tilt angle. So accelerometers can be used in a lot of applications as two-wheel balancing system, vibration sensing machine, tilting remote etc.. This concept can be used in robotics where one can control an RC car/robot's motion. In remote-controlled robots, a minimum of two axes are required; one for the forward-backward motion while the other is for left-right motion.

The Accelerometer IC (MMA7260) used in this project is sourced from free scale semiconductors. The wireless control transmission is achieved by using a combination of RF modules (TLP-RLP 434) with a pair of encoder decoder ICs (HT12E & HT12D).

The project makes use of the MMA7260's voltage levels (0 to $V_{cc}/2$) corresponding to X and Y axes. Since an RC car/robot requires four channel control commands we feed these voltage levels into a set of four comparators (LM324) with reference voltages governed by the POTs R3 R4 setting and the output of these comparators are fed into the encoder IC.

ACCELEROMETER:

An accelerometer is a device that measures the proper Acceleration. It has multiple applications in industry and science. Accelerometers are used to detect and monitor the vibration in rotating machinery. Accelerometers are used in tablet computers and digital cameras so that images on screens are always display upright. Accelerometers can be used to measure the differences in proper acceleration, particularly gravity, over their separation in space.

IR SENSOR:

An IR (infrared) sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of objects as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it is called as a passive IR sensor.

DC MOTOR DRIVER:

It is provided an integrated motor driver solution for printers, scanners, and other automated equipment applications. The devices have one H-bridge driver and are intended to drive one DC motor.

DC MOTORS:

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic to periodically change the direction of current flow in part of the motor.

POWER SUPPLY CIRCUIT:

An unregulated Power Supply is the simplest of Power supplies to construct. Nearly all the electronic devices and circuits require some form of a dc power source for their operation either from a battery, solar cell or as a mains power supply. Rectification is the process of converting AC power into DC power.

II.LITERATURE VIEW

When an unfortunate event affects the motor capacity of a person, it is necessary to use devices like wheelchairs that offer a means of displacement for patients with motor problems of the lower limbs. Tremendous leaps have been made in the field of wheelchair technology. However, even these significant advances haven't been able to help quadriplegics navigate wheelchair unassisted. Some patients that cannot manipulate the wheelchair with their arms due to a lack of force or psychomotor problems in the superior members, request electric wheelchairs, frequently manipulated with head motion. The present article presents the partial result in the development of a wheelchair controlled by head motion, where the instruction is given by head motion.

III.METHODOLOGY

Accelerometer control automatic wheelchair for physically disabled people. A dependent user recognition accelerometer sensor has been integrated in this wheelchair. The wheelchair has also been developed to work movement of accelerometer which will help for the person whose limbs are not working. Accelerometer can be attached to any part of the body of physically disabled person which he can easily move like head, hand etc...

WORKING MODEL:**Fig(a): working model****Fig(b):working model****ADVANTAGES:**

- a. User friendly.
- b. Reduces the human activity.
- c. Reduces the physical strain.
- d. Spontaneous output.

CONCLUSION

In the race of man versus machine head motion controlled system comes as an example of companionship of man and machine. In this paper a technique of head motion recognition is used to enable wheelchair control for quadriplegics. To avoid physical hardship an accelerometer is used due to which the slight movement of head turns the wheelchair in to the desired direction. It is designed to be characterized by low price and higher reliability.

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