A review of GESTURE CONTROLLED WHEEL CHAIR

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Abstract-*Wheelchairs are used by the people who cannot walk due to physiological or physical illness, injury or any disability. Recent development promises a wide scope in developing smart wheelchairs. The present article presents a gesture based wheelchair which controls the wheelchair using hand movements. The system is divided into two main units: MEMS Sensor and wheelchair control. The MEMS sensor, which is connected to hand, is an 3-axis accelerometer that provides hand gesture detection and gives it to the PIC controller. Gesture recognition can be seen as a way for computers to begin to understand human body language, thus building H type bridge between machines and humans then primitive text user interfaces or even GUIs (Graphical User Interfaces), which still limit the majority of input to keyboard and mouse. The MEMS sensor senses the angle of the hand, i.e. according to the tilt of hand it gives voltages to microcontroller. The wheelchair control unit is developed using PIC controller. Gesture recognition enables humans to interface with the machine (HMR) and interact mechanically without any mechanical device. Using the concept of gesture recognition, it is possible to point a finger at a computer screen so that the curser will move accordingly. This could potentially make conventional input devices such as mouse keyboard and even touch-screen redundant. The wheelchair control unit is a wireless unit that is developed using other controller.*

Index Terms: Accelerometer, Transmitter, Receiver.

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1. " GESTURE CONTROLLED WHEEL CHAIR"

Micro Electro Mechanical Systems (MEMS) technology has enabled the development of highly-reliable solid-state inertial sensors and systems for use in a wide variety of static and dynamic motion measurement applications. MEMS inertial sensors and systems are based on micro-machined silicon structures that are designed to detect the linear and/or angular motions of a freely moving body using the principles of inertia. These chip-level silicon structures contain no moving parts, offer extremely low power and high reliability, and exhibit low sensitivity to vibration and shock. As a result of these key features, MEMS inertial sensors are ideally suited to a wide variety of applications, and provide a significant size, weight and cost advantage over the more traditional mechanical and fiber optic inertial technologies.

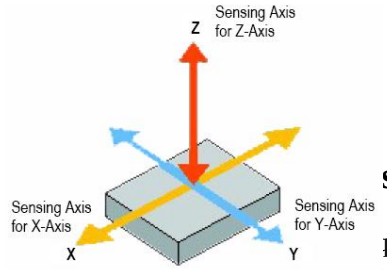
1.1 INTRODUCTION

The ADXL325 accelerometer sends the acknowledgement of its presence back to the controller. On receiving the positive acknowledgement, PIC microcontroller initializes the registers of the sensor. After the initialization of the sensor registers PIC microcontroller start calling the data stored in the sensor memory one by one. Data which is called is stored in two temporary registers Rd (0) and Rd (1) so that routine functioning of the controller is not disturbed. The data stored in temporary registers is then sent to the PIC controller for further processing. At the receiver, the value for x direction is initialized at port 1. The value at port 1 is then stored in accumulator register. Now the digital output received from the transmitter is compared one by one with the value of

accumulator. If the value is equal to 13 then the motor connected at port 2 using motor driver performs stop function and the value motor driver is oooo. If it is not equal to 13 then the value of accumulator is compared to next output and so on.

2. ACCELEROMETER

Accelerometers are the core of the vibration monitoring data collection process. They are used most often in predictive maintenance and condition-monitoring applications as the source of the electrical signal that corresponds to the vibration level. The accuracy of a vibration monitoring system depends on the quality of data received from the accelerometer. MEMS IC uses several different MEMS sensor technologies in its accelerometer product family. Each technology is employed for its performance and suitability for key applications



3.propos scription

This projec jue with 3 D motion. In this project we use two circuits. One is transmitter and second is receiver circuit. In the transmitter circuit we use 3 Axis accelerometer base circuits and at the receiver end we use a small wheel chair with RF receiver circuit.

3.1 Transmitter:

In the transmitter circuit, as shown in fig.1, we measure the value of 3Axis accelerometer based on the hand movement and converted into digital with the help of ADC 0809. ADC converts the data from sensor and proceeds to the microcontroller for further conversion. Microcontroller gets the hex data from the accelerometer and converted into ASCII code for LCD display. LCD display the X—Y—Z values and display the values on the LCD. At the same time microcontroller gets the data and compare inside with pre-defined variables. As we change the position of hand, values are change automatically and change values are also shown on the LCD.

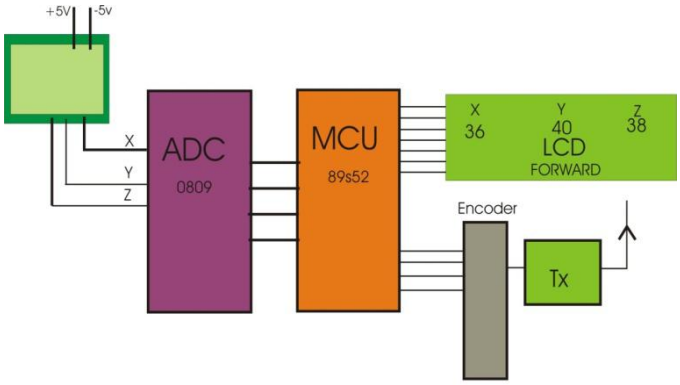


Figure3.1: Block diagram of Transmitter.

3.2 Receiver:

In the receiver circuit, as shown in fig.2, there is a RF receiver, decoder circuit and motor driving circuit. Receiver receives RF frequency transmitted from the transmitter and sends this signal to the HT12 D decoder circuit. Output from the decoder circuit send commands to motor driver circuits. H- Bridge is used to drive the motors of the wheel chair. Direction of the chair movement is depended upon the received signal.
Depending upon the movement of the hand or head wheel chair moves in four directions like- forward, backward, left and right.

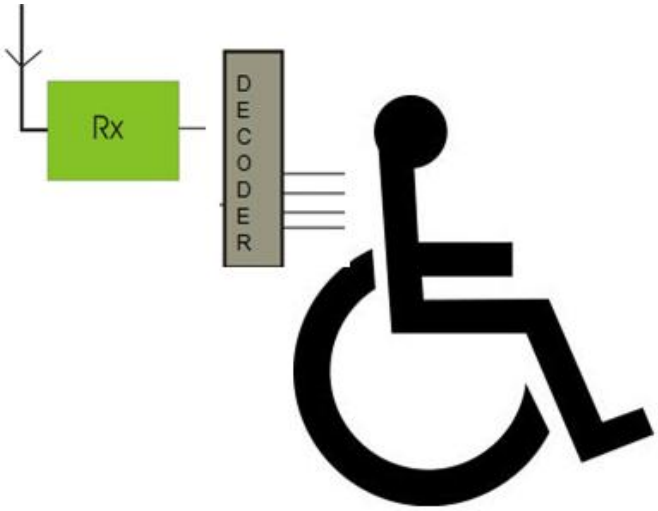


Figure 3.2: Block diagram of Receiver.

4. CONCLUSION

Thus in this way in our Project we are able to cut down the serial cable, which is used for updating the data message. Due to which we got success in making a Portable and Useful Display LED Board, which can drive by using the wireless technologies.

5. ACKNOWLEDGEMENT

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