

HAND MOVEMENT BASED VEHICLE CONTROL SYSTEM

B.Poornima^{#1}, P.Sneha^{#2}, K.Jyothsna^{#3}, R.Rajitha^{#3}

BVRITH, 8106790721, poornimapony@gmail.com
BVRITH, 9160122286, psnehamudiraj1@gmail.com
BVRITH, 9652034758, kolipakajyothsna96@gmail.com
BVRITH, 9676235255, rajitharapelli65@gmail.com

ABSTRACT

The project is to make a vehicle that can be controlled wirelessly by hand gestures for physically challenged people. The person who is driving car will be equipped with a device, which is placed in the hand of the person and it helps to move the steering forward and reverse direction without any physical or mental stress. This involves two modules. One is the glove that translates the motions of the hand using Mems and wirelessly through RF modules transmits it to the vehicle. The vehicle here being the second module that interprets the signal sent in by the Mems and modifies its motion with respect to the signal given by the hand gesture. The car itself simulates the motion of a vehicle using a servo for its steering mechanism and steppers for its movement, speed control.

The project uses two geared motors of 60RPM to drive the prototype of car. Also this car can take sharp turnings towards left and right directions. We are also using four switches in the circuit which will be ON when the person will move hand forward and backward. The three switches are interfaced to the MEMS. The en1921coder continuously reads the status of the switches, passes the data to the 89S52 microcontroller which will take the control of the driving of the car.

Keywords : Microcontroller, Mems, RF signal, power, switches, transmitter module.

Corresponding Author: R. Shylaja, Asst. Professor

INTRODUCTION

Embedded systems are designed to do some specific task, rather than be a general purpose computer for multiple tasks. Some also have real time performance constraints that must be met, for reason such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs.

An embedded system is not always a separate block - very often it is physically built-in to the device it is controlling. The software written for embedded systems is often called

firmware, and is stored in read-only memory or flash convector chips rather than a disk drive. It often runs with limited computer hardware resources: small or no keyboard, screen, and little memory.

Wireless communication has become an important feature for commercial products and a popular research topic within the last ten years. There are now more mobile phone subscriptions than wired-line subscriptions. Lately, one area of commercial interest has been low-cost, low-power, and short-distance wireless communication used for \personal wireless networks.& quote; Technology advancements are providing smaller and more cost effective devices for integrating computational processing, wireless communication, and a host of other functionalities. These embedded communications devices will be integrated into applications ranging from homeland security to industry automation and monitoring. They will also enable custom tailored engineering solutions, creating a revolutionary way of disseminating and processing information. With new technologies and devices come new business activities, and the need for employees in these technological areas. Engineers who have knowledge of embedded systems and wireless communications will be in high demand. Unfortunately, there are few adorable environments available for development and classroom use, so students often do not learn about these technologies during hands-on lab exercises. The communication mediums were twisted pair, optical fiber, infrared, and generally wireless radio.

MATERIALS AND METHODS

Hand movement based vehicle control system works on the principle of Mems which records hand movements and sends that data to the comparator which assigns proper voltage levels to the recorded movements. That information is then transferred to an encoder which makes it ready for transmission. On the receiving end, the information is received wired via Mems decoded then passed onto the microcontroller which take various decisions based on the received information. These decisions are passed to the motor driver L293D which triggers the motors in different configurations to make the vehicle move in a specific direction.

Task was divided into two parts to make the task easy and simple and to avoid complexity and make it error free. Here also, the task is divided into two sections and they are: transmitting section and receiving section. The first is he transmitting section which includes the following components: Mems, smoke sensor. The second is the receiving end which comprises of following main components: Microcontroller, Motor Driver IC, DC Motors. The Mems records the hand movements in different directions. Mems work on three co- ordinate axis X,Y,Z is the gravitation axis, remaining axes as four resistors. When the mems moved in one side then the rotated side will have more resistance and the remaining sides resistance will remain constant. As the resistance changes the voltage also changes and these variations are given to microcontroller, which processes the input and encodes the data into digital. Based on the different digital inputs motor driver will drive the motors, which are connected to the wheels of the vehicle. By using L293D driver will drive the vehicle in that specific direction based on the output of the microcontroller.

A smoke sensor is connected one of the port pin of microcontroller, this is used when there is any occurrence of fire accidents, these smoke detector will detect the smoke and make the buzzer on and it also stops the vehicle.

RESULT

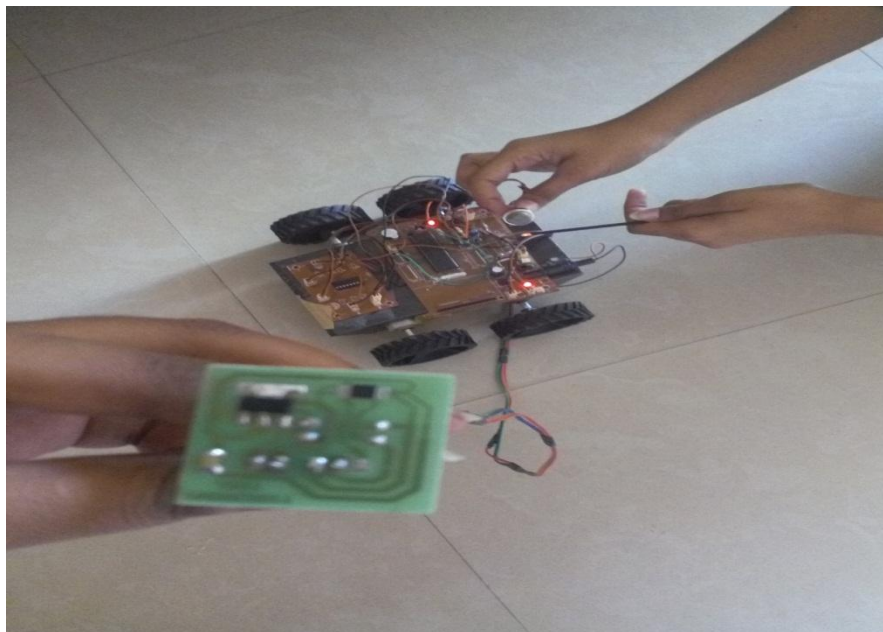


Fig 1 : output

CONCLUSION

The project report began with the introduction to the basic functioning of microcontroller as central controlling units for various other sections like mems sensor, voice sensor, adc, interfacing between all sections required for system and microcontroller 89S52 has been done successfully. Mems sensor is portable and this system operation is entirely driven by wireless technology. User can wear it to his head like a band and can operate it by tilting it. This sensor finds the tilt is to the right side then the device will be on for the first time then next time it will be off. In the same way, if the tilt is to the left side then another device is going to be controlled. The tilt is in upwards or downward direction the related need will be announced. This device is very helpful for paralysis and physically challenged persons.

REFERENCE

1. '8051-MICROCONTROLLER AND EMBEDDED SYSTEM', MOHD. MAZIDI.
2. 'EMBEDDED SOFTWARE PRIMER', DAVID .E. SIMON.
3. 'ZIGBEE WIRELESS NETWORKS AND TRANSCEIVERS', SHAHIN FARAHANI .

WEB REFERENCES

1. <http://www.keil.com>.
2. <http://academicscience.co.in/admin/resources>.
3. <http://www.ijaetmas.com/wp-content/uploads/02/IJXCJ0109.pdf>.
4. <http://www.engineersgarage.com/contribution/accelerometer-based-hand-gesturecontrolled-robot>.
5. http://en.wikipedia.org/wiki/Gesture_interface.
6. http://www.lboro.ac.uk/microsites/mechman/research/ipm/Technology_review