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Control of Wheel Chair and Home Automation Using Mobile Application

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Abstract: **- It is difficult for the people who are aged and having physical disabilities to move about and to operate house hold appliances without any external help. The proposed project based on Bluetooth technology is targeted for above mentioned people. It enables them to move independently from one place to another place without any external aid and at the same time it also helps them to operate house hold electric appliances using wireless communication. The wide spread prevailing loss of limbs is day-to-day scenario due to wars, accidents, age and health problems [2]. The proposed system is prototype wheel chair that can be commanded by patient itself. The main advantage is to design a wheelchair that will be operated using wireless blue technology and will be very easy to operate it with no physical efforts [1]. This paper analysis the motion technology through android mobile application with an inbuilt Bluetooth module. The Signals from the Bluetooth module are controlled by the microcontroller.**

Keywords **:- Android mobile application, Bluetooth module HC-05, Wheelchair, LPC2148Microcontroller, DC Motor.**

I. INTRODUCTION

Medical field also includes the use of embedded systems. An aged or physically disabled person come across many problems while moving from one location to other and operate the conventional switches which are located in parts of building. Such a person uses a wheel chair to move which is manually controlled and the person disabled should be strong enough to operate or other person must direct the movement of the chair. To solve this problem a wheel chair is designed which can be controlled by user without others help and at same time conventional switch are replaced with centralized control system to operate the house hold appliances located at remote places. The purpose of our project can be extended to other mobile devices which includes Android powered mobile phone by sharing the application. The main second part of our system architecture has a microcontroller LPC2148 which drives the various directions of the dc motor for movement of wheelchair and power of the DC motor for linear motion of the wheelchair [2]. The DC motor controls the front wheels of wheelchair for rotation while the pair of DC motor connected to the rear wheels enable linear motion. Also a temperature sensor is placed to measure the temperature of a person sitting in wheel chair.

II. LITERATURE SURVEY

By referring to a study conducted by World Health Organization [3], nearly every one person in fifty is suffering from paralysis due to damaging of nervous system. The causes of paralysis are mainly due to spinal cord injury, strokes and cerebral palsy. The graph titled "PROPORTION OF DISABLED POPULATION BY RESIDENCE INDIA: 2001-11" describes increase in percentage of disabled persons in India both in rural and in urban areas during last decade. The paralyzed person gets restricted to wheelchair and become dependent on other humans for their movement and daily needs. Many attempts have been made to customize the wheelchair by adding accessories to the wheelchair. The existing wheelchair in market like voice controlled wheelchair, joystick wheelchair and head control wheelchair have some or other drawbacks such as environmental disturbances, mechanical problems or expensive. So in this paper we have made the disabled people independent so that they are free to move on their own wish and need. The complexity is decreased and hardware requirement is also less.

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III. BLOCK DIAGRAM

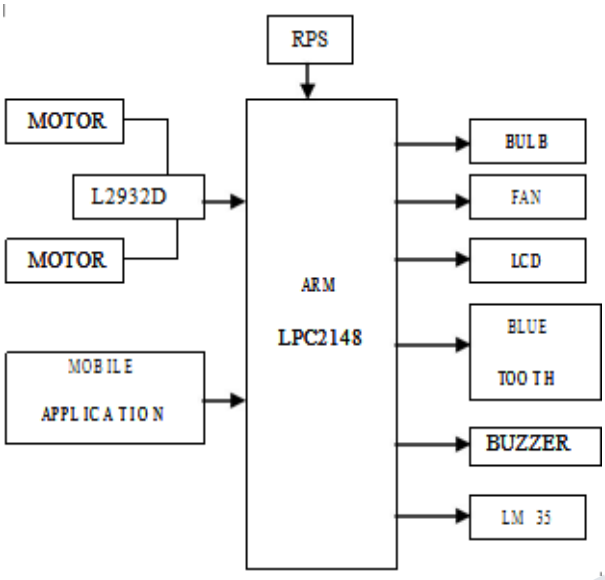

Fig 3.1:- Block diagram of prototype

IV. WORKING

The device functioning can be seen in one parameter android application the commands will be generated by means of the direction to which the wheel chair has to move. The application contains a table as per locomotion of device and home automation with on and off keys for individual movements and appliances. When the power supply that is connected to microcontroller is turned on the input provided by user is recognized in microcontroller, it triggers the rare end motors of wheel chair when command is performed. Thus the wheel chair moves in selected direction and can control home automation desirably. This is displayed on the mobile phone screen. The relay circuit is switched on using logic switch .This drives the DC motor of wheel chair that are attached at the rare end. The wheel chair can be stopped with the help of off keys. The user setting on chair can check temperature using sensor when it exceeds its cut off value buzzer gets turned on automatically.

4.1 IC L293D (DC MOTOR DRIVER)

L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers function as current amplifiers since they take a low-current control signal and provide a higher current signal. This is used to drive the motors. The principal of DC motor is that, magnetic field experiences a torque and has a tendency to move, when current carrying conductor is placed in magnetic field. This is known as motoring action. If the direction of current in the wire is reversed, the direction of rotation also reverses. When magnetic field and electric field interact they produce a mechanical force, and hence the DC motor works.

4.2 POWER SUPPLY BATTERY:

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit. The term is commonly applicable to electrical energy supplies, also to mechanical ones, and rarely to others. This power supply section is used to convert AC signal to DC signal and also to reduce the amplitude of the signal. The voltage signal available from the mains is 230V/50Hz which is an AC voltage, but the required is DC voltage with the amplitude of +5V and +12V for various applications.

4.3 HC-05 BLUETOOTH MODULE:

The HC-05 Bluetooth module is very popular module for wireless communication. It is easy to use Bluetooth SPP module, designed for wireless connection. This Bluetooth module can provide switch mode between master and slave mode. This serial port HC-05 module is completely qualified Bluetooth V2.0+EDR, 3Mbps modulation.

V. RESULT

The purpose of our complete prototype wheel chair is to move a vehicle and make home automation by using the mobile phone android application for command action with the help of wireless Bluetooth Technology as the interfacing media. This wireless is interfaced with the system by means of android platform. Where buzzer gets turn on when temperature goes above cut-off value set by user.

VI. ADVANTAGES

- Easy to drive with no efforts.
- Less complexity and less hardware is used.
- Wireless control helps to track the wheel chair easily.
- Reduces manpower and dependency on other people.
- Provides easy locomotion and automation of home appliances for physically disabled people.
- Easy to develop an existing wheel chair and does not require any sophisticated components.

VII. CONCLUSION

- The proposed project will help all the people who are depended on wheel chair for their locomotion.
- All common man can stick out to this wheel chair to become independent if they hold a android mobile phone.
- The application can be useful by many android phones.
- Wheel chair and home appliacnces is easy to operate and does not requires any external manpower.

VIII. FUTURE SCOPE

By the use of gear box we can be able to produce a high speed moving wheel chair. Also by PWM modulation we can increase the speed .Solar panel can be used to charge the battery for powering supply to the components necessity to handle th wheel chair. As it is not applicable for longe distances, we can make use of wifi technology for long distance mobility.

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