International Journal on Emerging Technologies (Special Issue NCETST-2017) **8**(1): 579-581(2017)
(Published by Research Trend, Website: www.researchtrend.net*)*

ISSN No. (Print) : 0975-8364
ISSN No. (Online) : 2249-3255

Smart electronics wireless based wheelchair operated by using Mobile Application

Vishal Yadav[1] and Rakesh Kumar[2]
[1]Project Student, Department of Electrical & Electronics Engineering,
Amrapali Institute of Technology & Science Haldwani College of Engineering, Haldwani, (U.K.), INDIA
[2]Professor and Project Faculty member, Department of Electrical & Electronics Engineering,
Amrapali Institute of Technology & Science Haldwani College of Engineering, Haldwani, (U.K.), INDIA

ABSTRACT: The recent development in the robotics or sensor technology promises enormous scope for the development of an advanced and digital wheel-chair. The wheel chairs used by the patients earlier have some limited function such as manual locomotion and may be slip-offs from the slant passages or the staircases. In this project we are trying to include Bluetooth & wireless with an android platform to develop an automated wheel chair which can help the patient to control the direction of the wheel chair based on wireless, to detect the obstacles, and touch recognition by using android software.

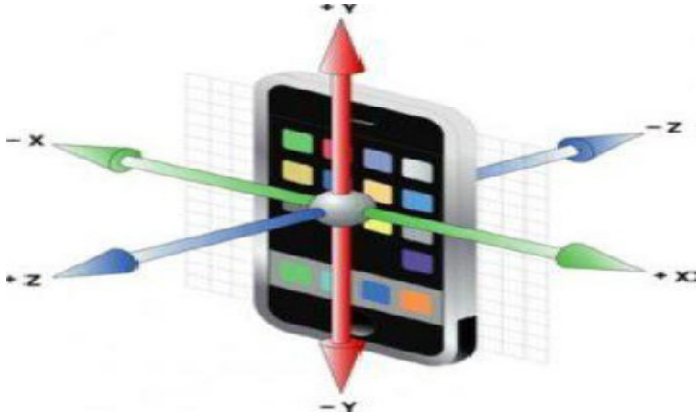
Keyword: Touch screen, Bluetooth, ATmega16 microcontroller, IR sensors, Android application, L293D Motor Driver.

I. INTRODUCTION

Increased percentage of elderly and disabled people who want to enhance their mobility, the best assistive device is wheelchair. A disabled can find it convenient to move around using the help of a chair constructed on wheels which can either be moved forward by another individual or propelled either by physical force or electronically. Traditional wheelchairs have some limitations in context to flexibility, bulkiness and limited functions. Our approach allows the users to use the technology by means of smart phones for the movement of the wheelchair so that they cause it with comfort and ease. Some existing wheelchairs and are fitted with the computers for the gesture recognition. But making use of it along with the chair makes it heavier and also increases complexity. This complexity is reduced by making use of the wireless, the size of which is very compact and can be placed on the fingertip of the patients.

II. DEVICE FUNCTIONING

The device functioning can be seen with one parameters.
Android Touch Screen:



Touch screen software is developed on the eclipse IDE platform. The commands will be generated by means of the direction to which the wheel chair has to move. Here the obstacle detection path will be interfaced to both the units accelerometer and touch screen mode. The table as per the locomotion of the device is given below. The following are keys and their associated letters stored in the buffer IC kit to move the wheelchair in the specified direction as tabulated in Table. The touch screen input used in the proposed system is a 5-wire resistive type. It consists of five keys. In addition a brake control switch is used to stop the wheelchair when used in this mode.

Forward	1
backward	2
Left	3
Right	4
stop	5

When power supply is turned ON, the subject selects the type of input mode by using the input selection switch. The corresponding mode gets displayed on the Mobile phone. Here the touch screen mode is initialized andis put on stop mode. This input when recognized in the microcontroller, it triggers the rear end motors of the wheelchair when command is performed. Thus the wheelchair moves in the touched direction key. Each key in the touch screen consists of a range of value for each direction that is coded in the microcontroller. This is displayed on the Mobile phone screen. When controller recognizes the particular value; the relay circuit is switched ON using a logic switch. This drives the DC motors of the wheelchair that are attached at the rear end. The wheelchair can be stopped with the help of a brake switch to avoid collision. When one wants to stop the wheelchair, the key 5 is pressed.

Two Viper Motor

The principal of DC motor is that, when a current carrying conductor is placed in a magnetic field, it experiences a torque and has a tendency to move. 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.

III. IC ATMEGA16 MICROCONTROLLER

ATmega16 is an 8-bit high performance microcontroller of Atmel's Mega AVR family. Atmega16 is based on RISC architecture with 131 powerful instructions. Most of the instructions run in one machine cycle. Ate mega 16 can work on a maximum frequency of 16MHz. ATmega16 has static RAM of 2 KB, EPROM EEPROM of 1 KB and 32 KB programmable flash memory.AVR microcontrollers find many application as embed.

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.

Power Supply Battery:

A DC power supply is one that supplies a voltage of constant polarity (either positive or negative) to its load. Depending on its design, a DC power supply may be powered from a DC or from an AC source such as the power mains. Here 12V at maximum 7A supply battery is used.

IV. BLUETOOTH HC05 (INTERFACING)

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent serial connection arrangement. Serial port Bluetooth system is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3 mbps Modulation with 2.4GHz radio transmission reception and baseband. It uses CSR Bluecore 04-External single chip Bluetooth system with CMOS technology and with Adaptive Frequency Hopping Feature. It has the footprint as small as 12.7mmx27mm.

V. RESULT

The principle of complete model is to move a vehicle by using the mobile phone system with the help of Bluetooth.

Technology as the interfacing media and android application for the command action. An inbuilt wireless system is used here for the motion of the vehicle. This wireless is interfaced with the system by means of android platform.

VI. CONCLUSION

We have successfully designed effective system which works the requirements. The wireless technology implemented in the application is helpful for disabled individuals for efficient movability.

The PCB is designed in EAGLE software. The power supply was simulated in protest simulation software for a prototype. Thus, we have successfully developed the interface of the application and wheelchair. The speed and control of the wheelchair can be controlled or increased with the help of viper motors. We can interface camera and sensors on the wheelchair so that anyone can monitor the wheelchair for safety reasons. And built a cost

ACKNOWLEDGEMENT

All the Authors are thankful to the Project Faculty member, Prof. Jyotsna Mehra and the HOD for their support in providing the necessary hardware as well as software and permission to present this paper in conference.

REFERANCES

Diksha Goel and Dr. S.P.S Saini, '"Wireless based hand gesture controlled wheel chair" Dept. of Electronics and Communication Engineering, NGF College of Engineering and Technology (HR), IEEE-2013 (Received 15th may, 2013 Accepted 01ST June 2013).