NHSEMH - 2023
2nd National Conference on New Horizons in Science, Engineering, Management and Humanities
International Journal of Scientific Research in Science and Technology
Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Android Based Automated Wheel Chair

Lokesh Bisht, Nikhil Gupta, Naresh Sharma, Kaushindra Rawal, Deepak Chadar
Department of Mechanical Engineering, IIMT College of Engineering, Greater Noida, Uttar Pradesh, India

ABSTRACT

This project gives the automated function in wheelchair. This is an android based automated wheelchair that can be used by differently able. It uses android based smart phones which have inbuilt axis accelerometer sensors and Bluetooth wireless technology. The proposed concept exploits this feature of the smart phones to use at as a transmitters and control device.

Keywords: Accelerometer sensors, wireless Bluetooth, Frame (Materials), Seat, Backrests, Wheels, Controls, Batteries.

I. INTRODUCTION

This is an android based automated wheelchair that can be used by differently able. It uses android based smart phones which have inbuilt axis accelerometer sensors and Bluetooth wireless technology. The proposed concept exploits this feature of the smart phones to use at as a transmitters and control device.

Fig.1 Automated wheel chair

1.1 Transmitting section:

Accelerometer – the smart phones accelerometer is a semiconductor IC that measures motion and its intensity in 2 axis.

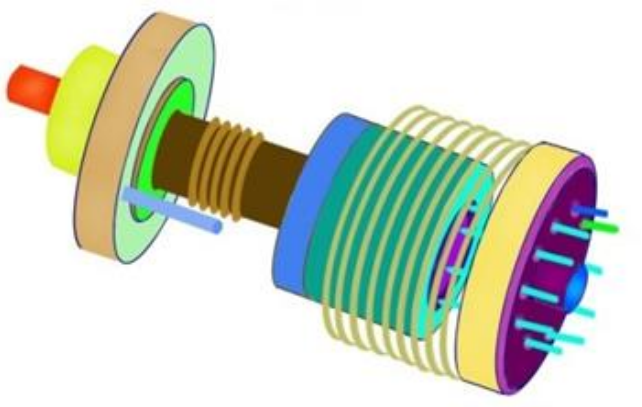

Fig.2 Accelerometer

1.2 Receiving section:

Microcontroller – Its need involves the reception of data signals that are transmitted by the smart phone via Bluetooth module and control the working of servo and DC motors. The wheel chair interacts with

the smart phone app by means of this a mega 16 microprocessor via Bluetooth.

1.3 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. 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.

1.4 Obstacle detection:

Obstacle detection is a major parameter in order to cross check any discrepancy in the path over which the device is moving. To detect the obstacle, IR sensor pairs are mounted on the front and the diagonal end. The front end IR sensor will detect the collision with respect to wall or any obstacle. The range of these IR pairs is predefined in the data sheet. The front end sensor pair can sense the obstacle at approximately 15cm for 2.8 V.

II. LITERATURE SURVEY

In this paper 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 sensors 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 accelerometer, to detect the obstacles, and touch recognition by using android software. [1]

In this particular article the wheelchair is controlled by using hand gesture. Here mems sensors and wheelchair are two main units. Mems sensors are basically used here for gesture detection. After gesture detection the sensor converts it into 6 digit binary value. This value is then given to. Pic microcontroller and accordingly the wheelchair moves. Other controllers are used for the movement of wheelchair. [2]

In this article the wheelchair is controlled by voice commands as well as using hand gestures. Here there is a speech recognition model which use mems sensors along with a wheelchair control unit. Hidden Markov models are the main voice recognition commands. The mems sensors give the voltage to the microcontroller according voltage to the microcontroller according to the titration of hand. ARM controller is used in this article. [3]

There are wheelchairs with joystick interface but many people are unable to use this facility. Navigation at low level can allow the users an efficient driving assistance. In this article the wheelchair consists of GUI i.e, graphic user interface, sensors and on-board computers. Here the wheelchair uses the indoor navigation facility and user interface for user abilities. [4]

This article has proposed an intelligent wheelchair which has dual control for navigation. The voice recognition and touch screen are two modes of input control commands. There are different values for different program on the screen. To move the wheelchair in various directions the user has to touch the screen accordingly. Voice control is also used in order to know the wheelchair. The wheels move using brushless DC motors at the rear end and PWM technique is used for controlling it. [5]

In this paper a smart wheelchair is developed. This wheelchair is much easier to use than the standard power wheelchair. A smart wheelchair component system (SWCS) is developed which is created doing minimum modifications. Four different manufacturers are used for evaluation of SWCS prototype. [6]

This articles deals with WST i.e. wheelchair slow Transit system band elderly auxiliary travel model. Support, transit components and connection components are three fundamental composition frames involved in the system. Diverse conditions are

III. CONCLUSION

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 accelerometer system is used here for the motion of the vehicle. This accelerometer is interfaced with the system by means of android platform.

IV. REFERENCES

[1]. Khushboo Pasari1 , Madhura Patil1 , Kalpana Rokade1 , Pranali Yawle2, "Android based Wheel Chair" International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181, Vol. 5 Issue 03, March-2016.

[2]. Diksha Goel and Dr. S.P.S Saini, '"Accelerometer 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).

[3]. K. Sudheer, T.V.Janardhana Rao, CH. Sridevi, M.S. Madhan Mohan, "Voice and Gesture Based Electric-Powered Wheelchair Using ARM" Department of Electronics and Communication Engineering, B.V.C. Engineering College, Odalarevu, AP, INDIA. E-mail: sudheer.kanuri@gmail.com,

[4]. A. Yanco, "Wheelesley, a Robotic Wheelchair System: Indoor Navigation and User Interface" MIT Artificial Intelligence Laboratory,545 Technology Square, Room 70, Cambridge, MA 02139, Email id: holly@ai.mit.edu.

[5]. Aruna.c1, Dhivya Parameswari.a1, Malini.m1, Gopu.g2 "Voice recognition and touch screen control based wheel chair for paraplegic person" IEEE 2014 1) Project Students, Department Of Biomedical Engineering. 2) Professor& Head, Department of Biomedical Engineering. Sri Ramakrishna Engineering College, Coimbatore641022.

[6]. Richard Simpson, "The Smart Wheelchair Component System" PhD, ATP; Edmund LoPresti, PhD; Steve Hayashi, PhD; Illah Nourbakhsh, PhD; David Miller, PhD University of Pittsburgh, Forbes Tower, Pittsburgh, PA; Assistive Technology Sciences, Pittsburgh, PA; Robotics Institute, Carnegie Mellon University, Pittsburgh, PA; University of Oklahoma and KISS Institute for Practical Robotics, Norman, OK.

[7]. YanLin, LiBaon "Wheel chair slow transit system-based elderly auxiliary travel mode" Department of Architecture, Southeast University, Nanjing210096, China.