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Multicontroller Based Wheelchair Safety Using Android, Touch, Speed & Gesture Control

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ABSTRACT - Being disabled brings about a feeling of isolation from the outside world and a sense of dependability as we must depend on others help for just moving from one place to other and many other basic needs. Wheelchair has solved this problem to an extent as it's providing personal mobility for the aged and disabled. But it is very difficult for the disabled people to use the manual power of the wheelchair independently. As a solution to this problem, we have put forward a power wheelchair which can be controlled with a simple android device using IOT technology. We have used the technology initially used to control robots to control a power wheelchair using .an android device either by touch joysticks or by voice commands or by gesture. Detection of the obstacle will be performed using ultrasonic sensors This integrated model is a complete package for people with physical disabilities. Objective is to minimize the daily workload through automation. Implementing GSM model aims to promote simplicity in operating our smart wheelchair.

KEYWORDS: Android remote controller software; wheel chair; ultrasonicsensor; Bluetooth, transceiver, remotecontrol.

I. INTRODUCTION

Physical disability is increasing due to aging, accidents, and various diseases like paralysis. For this reason, the use of wheelchair is increasing. Some of the people who use the wheelchair cannot operate the wheelchair with their hands. So, they need the help of others to move the wheelchair from one place to the other. The android controlled wheelchair can overcome these problems mostly by the idea of implementing the wheelchair using android application, now a day's android mobile phones are commonly used. The wheelchair will be operated with the voice commands and gesture as inputs, which gives the directions as user directs. This wheelchair has gained more independent existence because the Arduino helps to covert the voice commands into outputs and the wheelchair can move freely. Along with this an ultrasonic sensor is used to detect the obstacles. By the proposed approach, the wheelchair will be working on the inputs such as voice, gesture and touch via an android phone that moves the wheelchair according to the commands provided. It. helps the physically disabled and aged people to move the wheelchair independently without any external support.



Fig 1. Multicontroller based wheelchair



II. LITERATURE SURVEY

In the past few years, many projects are developed related to the wheelchair. The existing wheelchair for the disabled and aged people are designed in such a way that they can't move independently without an external support. The developed projects are based on the joystick, voice, hand gesture and brain wave sensing. In the recent years, the battery powered wheelchairs also have been invented, which had gained popularity because it's more helpful for the physically disabled study on the electronic wheelchair controlled with a smart phone, here the author uses the android smart phone to control the wheelchair with voice commands. "Gesture based wheelchairs for physically disabled" focuses on the hand movements or the hand gesture to control the wheelchair. A Robotic wheelchair system: Indoor navigation and user interface" focuses on the development and evaluation of a robotic intelligent wheelchair system based on the obstacle detection.

Eyes based electric wheelchair control system" here the idea is to create an eye monitored system which helps the movements of wheelchair depending on the eye movements.

III.DESIGN

Designing and building a Smart Electric Wheelchair System that is not controlled using handmovements, voice commands. The outcome of this project will facilitate the mobility of people with disabilities. It can be used well with little effort by these people to be able to use it. monitoring body gestures will be added using the accelerometer module to control the wheelchair using gestures. The voice command feature will be using the Bluetooth module and will control the wheelchair with voice commands. Detection of the obstacle will be performed using ultrasonic sensors. This integrated model is a complete package for people with physical disabilities. Objective is to minimize the daily workload through automation. Implementing GSM model aims to promote simplicity in operating our smart wheelchair.

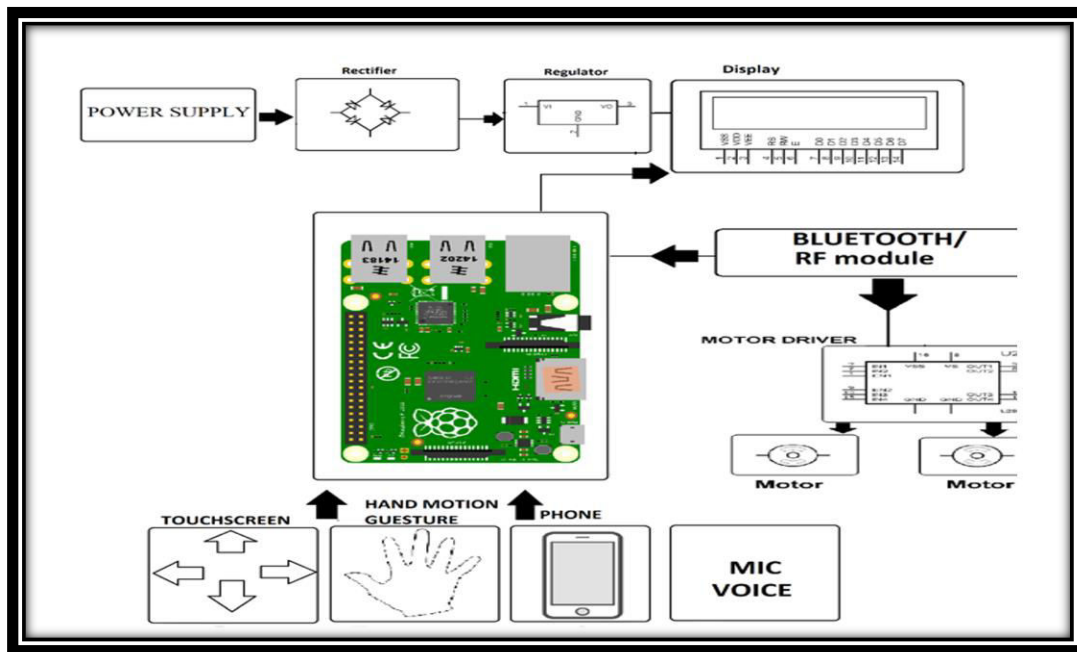


Fig 2. Block Diagram

IV. CIRCUIT DESIGN AND ELEMENTS

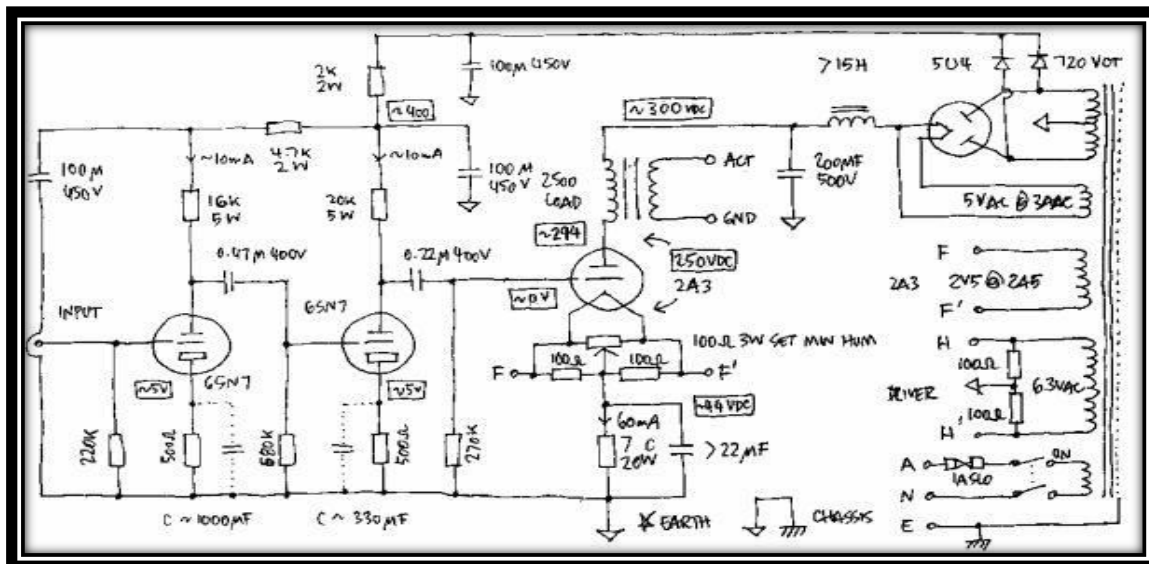


Fig. 3. Circuit Diagram of internal auto command wheelchair.

Arduino UNO: It is a Microcontroller board which here is used to control the wheelchair.

DC Motor: Two DC motors are used here for the movement of the wheelchair.

Bluetooth module: HC-05 Bluetooth module is used here for wheelchair and android mobile interface.

Battery: A suitable battery is used to power the wheelchair.

Android phone: An android phone with the wheelchair application is needed to control the wheelchair.

Sensor: HC-SR04 ultrasonic sensor is used for object detection

Wheelchair Chassis: A wheelchair is a chair with wheels, used when walking is difficult or impossible due to illness, injury, problems related to old age, or disability. These can include spinal cord injuries (paraplegia, hemiplegia, and quadriplegia), cerebral palsy, brain injury, osteogenesis imperfecta, motor neuron disease, multiple sclerosis, muscular dystrophy, spina bifida.

Bluetooth: Bluetooth operates on radio frequencies, rather than the infrared spectrum used by traditional remote controls, devices using this technology do not have to maintain a line of sight to communicate.

Mic Sensor: A microphone is a sensor for detecting sound. It is a device capable of transforming a pressure signal of sound into an electric voltage signal.

RF Tx Rx: This RF module is a combination of RF Transmitter and RF Receiver. The transmitter/receiver (Tx/Rx) pair operates at a frequency of 433 MHz The RF transmitter receives serial data and transmits it wirelessly through its RF antenna.

Accelerometer: An accelerometer is a device that measures the vibration, or acceleration of motion of a structure. The force caused by vibration or a change in motion (acceleration) causes the mass to "squeeze" the piezoelectric material which produces an electrical charge that is proportional to the force exerted upon it.

Other component: Resistors, Capacitors, Transistors, Cables and Connectors, Diodes, PCBLED, Transformer/Adapter, Push Buttons, IC, Software Specifications: Linux OS, Programming Language: Python



V. CONCLUSIONS

As a conclusion, the objectives of this project have been achieved successfully where this project was able to develop an android system that can control the movement of the wheelchair and to develop an android system that can control two appliances with the android phone. The development of an android-based wheelchair controller was fully functional base on the objective which are targeted before started this project

REFERENCES

- [1] Thomas Rofer, Tim Laue and Christian Mandel: “Controlling an automated wheelchair via joystick/head joystick supported by smart driving assistance” IEEE, 2019.
- [2] Richard C. Simpson, in the Journal of Rehabilitation Research and Development, “Smart wheelchairs: A Literature survey.
- [3] Mohammed Asgar, MirzaBadra, Khan Irshad, Shaikh Aftab, “Automated innovative wheelchair” in December 2013, International Journal of Information Technology Convergence and Services.
- [4] Holly A. Yanco, “Wheelesley: A robotic Wheelchair system: indoor navigation and user interface”, MIT Artificial Intelligence Laboratory 545 Technology Square.
- [5] Sachin S. Patil, Kiran N. Patil, Sanjay P. Patil: “Gesture based wheelchairs for physically disabled”, it focus the hand movements and the hand gesture for controlling the wheelchairs



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