Operating Wheelchair With The Help of Smartphone Through Various Modes

Chandrashekhar Chandolkar[1], Nikita Kadam[2], S.B.Umbarkar[3]
Department of E&TC
[1, 2] BE Students,MITCOE, Pune, India
[3] Assistant Professor,MITCOE, Pune, India

Abstract-Basically the people with the physical disability uses the wheelchair and day by day the users of wheelchair are increasing. Some development or modification should be done in the wheelchair. This paper describes the movement control of wheelchair by using the smart phone. Here we are controlling the wheelchair by using various modes .we are giving the audio commands to the wheelchair through the android app, which is connected to the wheelchair by wifi module. The second mode is gesture mode. We are using a device consist of acceleration sensor. The wheelchair will move on the basis of how much tilt that device have. In addition to that we are connecting temperature and pulse rate sensor to the model.

Keywords-Smart Wheelchair, Android Phone, control through voice, control through gesture, microcontroller, sensors.

I. INTRODUCTION

In the wheelchair which is operated manually some patients may not feel comfortable as it needs physical movement of the patient who is using the wheelchair or he may need help from others. So we needed a user friendly wheelchair for patients comfort. Now a days everyone uses smartphone which is very user friendly. So we connected the smartphone to the wheelchair through a Wi-Fi module and gave commands through it. We have used temperature sensor and a pulse rate sensor for measuring temperature and pulse rate respectively of the patient.

II. EXISTING SYSTEM

In present time there is no wheelchair controlled through android smart phone. In present time the wheelchairs are either controlled manually or they

Have some specific switches on the hand of the chair so patients have to choose the switches to perform specific operation. These are the existing systems.

III. PROPOSED SYSTEM

In this project an android application is used to control the movements of the wheelchair. The android application will have three different modes of operation and we can select any one of them. If we select gesture mode then the wheelchair can be moved by tilting the device. If we choose the voice mode then voice commands can be given and we can control the wheelchair. And we have touch screen options also for the different operations of the wheelchair. This is our proposed system.
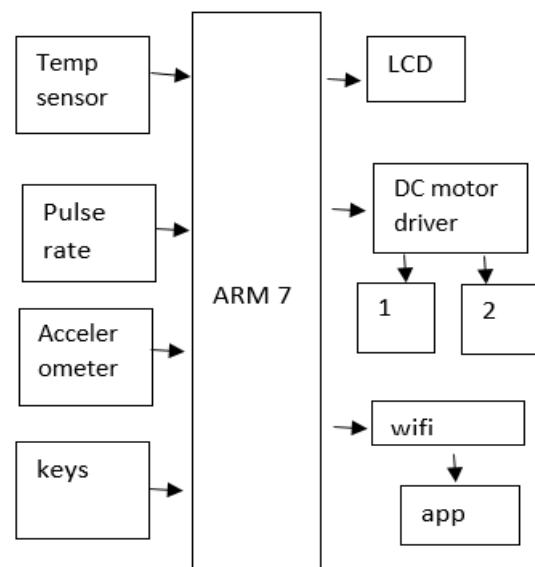
IV. BLOCK DIAGRAM

Fig 4.1: Block diagram

V.KEY COMPONENTS

1. LPC2138

Fig 5.1: Microcontroller chip

- Microcontroller   LPC2138
- Operating voltage   5V input
- Voltage recommended   7-12V
- Digital I/O   31
- SRAM   16 kB
- Flash memory   256 kB
- Clock speed   60 MHz

2. Temperature Sensor

LM35

Fig 5.2: Temperature sensor

- Scale factor   +10.0 mV/'C.
- Supply voltage   +35 to -0.2V
- Output voltage   +6V to -1V
- Output current   10 mA
- Accuracy   o.5'C
- Operating range   4-30 V
- Current drain   less than 60µA
- Temperature Range   -55 to +150'c
- Low cost

3. Wi-Fi module

ESP8266

Fig 5.3: Wi-Fi module
- 802.11 b/g/n.

- Integrated low power 32bit MCU.
- Contain TCP/IP protocol stack.
- Integrated PLL.
- 10-bit ADC.
- Supports antenna diversity.
- Operating temperature range -40 to +125'C.
- It has wide range of application like home appliances, home automation, sensor networks etc.
- Low cost.
- Easy available.
- User friendly.

VI. FLOW CHART

Description:

- The flowchart demonstrates the working of our project, of operating wheelchair with the help of smart phone android application.
- Firstly the output by ADC is given to the microcontroller which is ARM 7.
- Then the controller gets on and the Wi-Fi module gets activated.
- We send a signal or request to that Wi-Fi module to connect with the smartphone.
- After that establishment of connection takes place.

- In this way the wheelchair is connected to the smartphone through Wi-Fi.
- We can now process the required smart phone operation.
- There are different modes available, we can select anyone of them whichever we want.
- And then we can give any commands which are available on that android application.
- The android application sends the feedback to the Wi-Fi module.
- Then the Wi-Fi module sends the feedback to the microcontroller.
- As soon as the microcontroller gets the instructions from user it starts performing operation.
- According to the commands given by the user the microcontroller controls the movement of the wheels with the help of DC motor.
- In this way the operation of wheelchair is done with the help of smart phone.

VII. APPLICATIONS

- We can use this wheelchair in hospitals for patients.
- This wheelchair is very useful for the patients who live alone.
- We can use it for physically handicapped individuals.

VIII. ADVANTAGES

- User friendly.
- Time saving process.
- Man power is not required.
- Real time process.
- Power consumption is high.
- No need of physical movement.
- Low cost.

XI. DISADVANTAGES

- For using the wheelchair, that user must require a smartphone.
- The hardware for the manufacture is more.

X. CONCLUSION

By using this wheelchair physically disabled people find easy way to move or transfer within the house without the external help. And with the help of smart phone they will feel comfortable and easy to operate wheelchair.

ACKNOWLEDGEMENT

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