"SMART WHEELCHAIR CONTROL USING VOICE AND GESTURE CONROL"

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ABSTRACT

This paper is to develop a Smart wheel chair control which is helpful to the physically disabled person with his voice control or his hand gesture recognition using Acceleration technology. It is wheelchair which can be controlled by simple voice and hand gestures. When we change the direction, the sensor registers values are changed and that values are given to microcontroller. Depending on the direction of the Acceleration, microcontroller controls the wheel chair directions like LEFT, RIGHT, FRONT, and BACK. The aim of this paper is to implement hand gesture to control wheel chair.

Keywords-: *AVR microcontroller Atmega328,Microphone Smart WheelchairAccelerometer, Arduino compiler, Motor Driver IC L293D, Gesture Control, Voice Recognition Module V2.*

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1. INTRODUCTION

1.Voice Controlled Mode: by voice command we can control the wheel chair. The speech recognition software running on a Module is capable of identifying the 5 voice commands Run, Stop, Left, Right and Back, issued by a particular user. After processing the speech, the necessary motion instructions are given to the mobile platform via a RF link. Following is the system overview. The speech recognition software is speaker dependent. The special feature of the application is the ability of the software to train itself for the above voice commands for a particular user. The graphical user interface running along with the software provides a veryeassy and convenient method for the users to train. It also provides many other different facilities in operating the Wheelchair. This project experiment can store about 10 words each of 1.5 millisecond duration. The micro controller receives the data from the RF receiver and will check its database and perform the tasks like move forward means the robot motors runs forward, if they say move backward. The robot wheel will have backward motion. The robot will move back

2. Gesture Controlled mode:by hand gesture we can control the our robot chair / neck gestures not by old buttons. You just need to wear a small transmitting device in your hand which included an acceleration meter. This will send an appropriate command to the Wheelchair so that it can do whatever we want. The transmitting device included a comparator IC for analog to digital conversion and an encoder which is use to encode the four

bit data and then it will transmit by an RF Transmitter module. At the receiving end an RF Receiver module receives the encoded data and decode it by a decoder .This data is then processed by a microcontroller and finally our motor drive will be controlled as per instructions.

2. LITERATURE SURVEY

There are many researches done in the field of speech and voice recognition. Due to sophisticated signal processing algorithms and powerful computers and components available, computer based speech processing system nowadays have reached high accuracy with complex structure. The challenge is to maintain standard performance while using limited computation and memory resources. Researches in the area of wheelchair control system are still going on. Many people with disabilities do not have the skill as required to control a joystick on an electrical wheelchair. This can be a great drawback for the user who is permanently unable to move any of the arms or legs (paralysis or disable persons). They can use their wheelchair easier only using voice commands and using gesture module. In the proposed design, the main idea of using voice activated technology for controlling the motion of the wheelchair is to prove that it can be an excellent solution for severely disabled. The purpose of this project is to implement a speech recognition system to recognize the input words from the user.

3. EXISTING SYSTEM

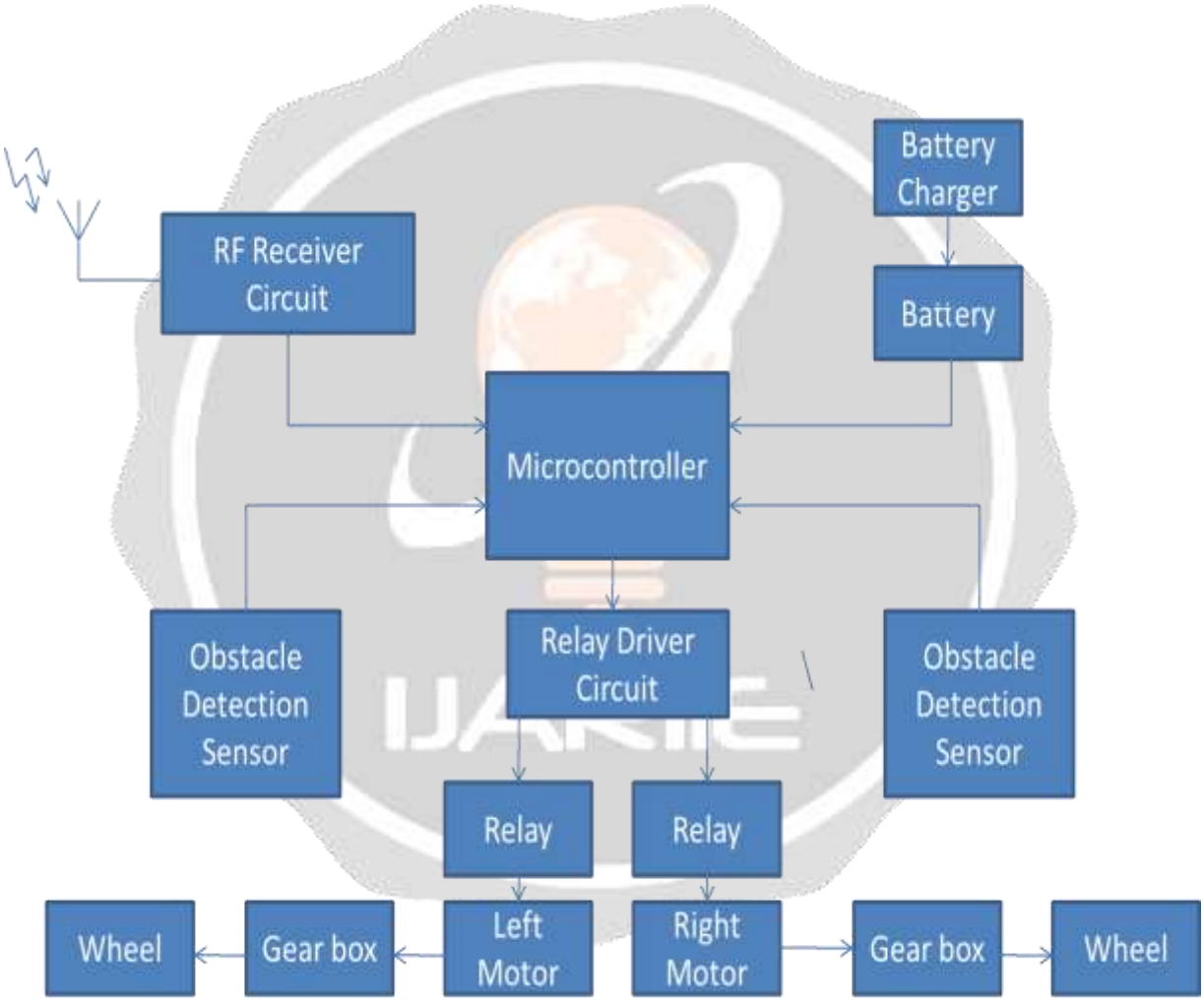
There are many researches done in the field of speech and voice recognition. Due to sophisticated signal processing algorithms and powerful computers and components available, computer based speech processing system nowadays have reached high accuracy with complex structure. The challenge is to maintain standard performance while using limited computation and memory resources. Researches in the area of wheelchair control system are still going on. Many people with disabilities do not have the skill as required to control a joystick on an electrical wheelchair.

4. PROPOSED SYSTEM

After several studies and survey around the world it have shown that both children and adults benefit substantially from access to a means of independentlymove freely. Though many disabled people can satisfied with traditional manual or powered wheelchairs, there is a category of disabled community find it difficult or impossible to use wheelchairs independently. Many researchers have used several technologies to make a wheelchair accessible to use for this population. Several wheelchairs have been developed with several control devices. The brain signal interfaces, vision based, head gesture based and many more controlled wheelchairs have been developed. The proposed work is to design and develop a smart wheelchair using a voice recognition and head gesture control system. It can be used efficiently with less effort by the users so that they can use it independently and easily.

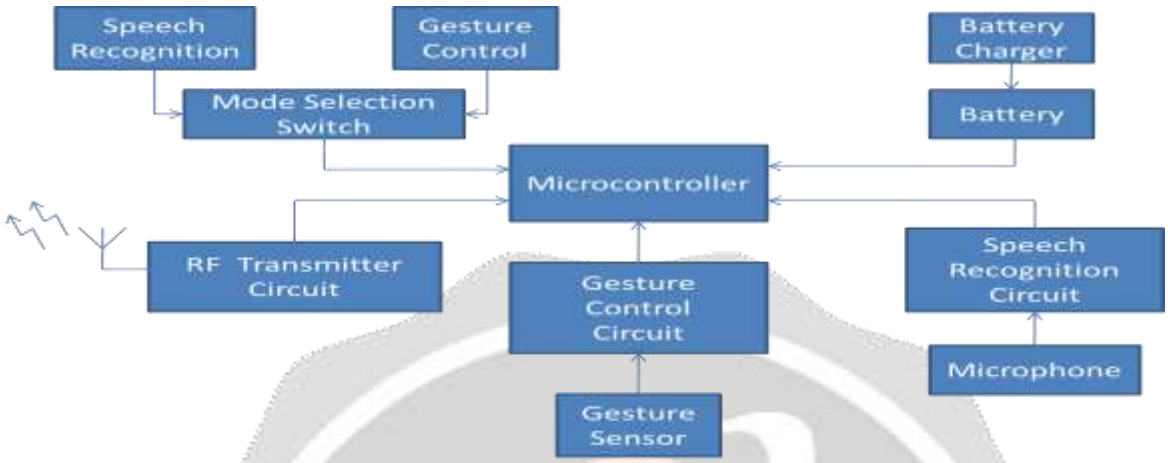
5. SYSTEM ARCHITECTURE

5.1 Voice Control Unit



Block Diagram1: Voice Control Unit

5.2 Gesture Control Unit



Block Diagram1: Gesture Control Unit

6. SYSTEM REQUIREMENT SPECIFICATION

6.1 SOFTWARE REQUIREMENTS

- Operating System: Windows 7 or higher.
- Proteus Software (For Simulation)
- Protel (For making PCB)
- Keil Software (For writing Code)
- ARDUINO 1.0.6

6.2 HARDWARE REQUIREMENTS

- ATMEGA328
- Transformer (For suitable voltage level).
- Voice Control Module.
- Gesture Control Module
- Flash magic (For downloading codes).
- Microphone.

7. TECHNICAL SPECIFICATIONS

7.1ADVANTAGES

- Increased the mobility
- Increased the physically disabled personManoeuvrability.
- Increase disabled people's ability to live free and independently.
- Life chances of disabled people.

7.2APPLICATIONS

- Used in Hospital's
- Health care centres

- Old age homes.
- Physically handicapped individuals in industries as robot to carry goods.

8. CONCLUSIONS

Our project was the complete combination of the electronic circuits, the hardware& software knowledge.Automatic wheelchair can be used to handicapped people, especially those who are not able to move.The system is successfully run to move the wheelchair left, Right, Forward, Backward or Stay in same position.

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