A Voice Controlled Wheel Chair Prototype for a Medically Challenged

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Abstract: *In this paper a voice operated wheelchair is beingutilized which is useful for the person who can't move their limbs on its own and also useful for the person affected from Parkinson disease.In this paper we have introduced a Elechouse voice recognition module V-3 with wireless transmitter and receiversection instead of a joystick because according to the report of WHO Speech Impediments count is low. These kinds of people can operate their wheel chair by using their voice command. A voice authentication process is also utilized.*

Keywords: *Voice operational Module, Encoder IC HT12E, Decoder IC HT12D.*

1. INTRODUCTION:

The basic idea of developing this project is to make the life of physically disable person easy. We have developed a sophisticated process to increase the quality of life and to make their movement fascinating. So that they can become similar to the person who do not have any deficiency. This technology is friendly than other recognition technique.Authentication can be easily changed by end user. There is no need of programmer to change authentication or recognition process. The voice technology used in the proposed work reduces physical effort of a disable person

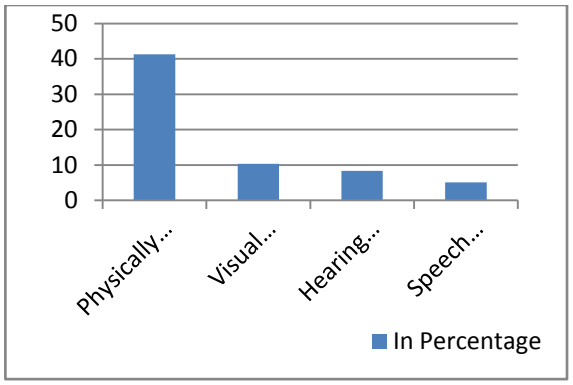
***1.1 Indian Statistic on Disability*:**We know that every second the population of world as well as India is increasing very rapidly. In India 120 million people are disable out of which 41.34% physically disable Unfortunately the number of physical disable people is continuously increase due to reason like accident and the disease like paralysis. The statistics given below is in the percentage out of 121 million of people.

Physically disability 41.34%

Visual impairment 10.31%

Hearing impairment 8.34%

Speech Disability 5.05%



The aim of this project is to implement speech recognition technology in wheel chair to move it automaticallyby using voice command. Wheel chair will require four commands to move.

These four commands are: Forward,backward, right, leftanda special command to stop the chair at any moment. Hencewheelchair becomes too useful for physicallydisable.Input is given through Mike which is inbuilt on the wheel chair itself.Joystick technology is replaced with voice technology by whichwheelchair becomes too easy in operation. Speech technology is used to reduce physical effort of the person with disability a voice module v3is utilized to perform voice action.

2. FLOWDIAGRAM:

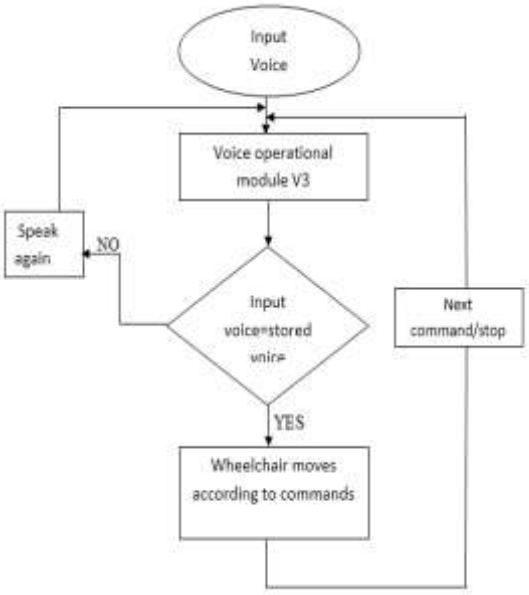


Fig. 2.1

The above flowchart shows the basic operation of the voice operated wheelchair. When the input command is given through mike then the input command is compared to the trained command. If the input command matches with the stored command then the controlled wheelchair moves according to the input command in the desired directionotherwise the error will generate and will be shown on digital display. The error syntax at display will be "E". Now input is given again to the voice module V3 for giving the command to move the wheelchair in next desired direction.

3. WORKING & HARDWARE SETUP:

In this paper there is a voice recognition module v3 which perform according to the user command, first of all we have to train the voice module with the end user's command so that it can recognize .There are 0 to 9 groups (10 groups) and 7 channel are available to store the command in to the speech recognition module v3. For each group we can store 7 commands. Hence we can store maximum 80 commands. It can detect the voice in the range of 30 meter.Here we have only used group 0 to store six commands (four motion commands and one stop command) for our project operation. The commands to train the voice module is shown in given table 3.1. Hence the training of the voice module v3 is completed and the module is ready for the operation for voice recognition.

Group	Channel	Command
0	1	Forward
0	2	Backward
0	3	Left
0	4	Right
0	5	Stop

Table no. 3.1

Now input is taken frommike. This input is processed in digital form by voice recognition module V3 and then the input signal is encoded by the encoder IC XT12E. This encoder IC generated 4 bit data and 8 bit address. This encoded signal is given to the wireless transmitter module. At receiver the signal is decoded by the decoder IC XT12D. With the help of inverter data is inverted and becomes an appropriate command.Now the speech recognized wheelchair moves according to the command in the desired direction such as Forward, Backward, Left, and Right.

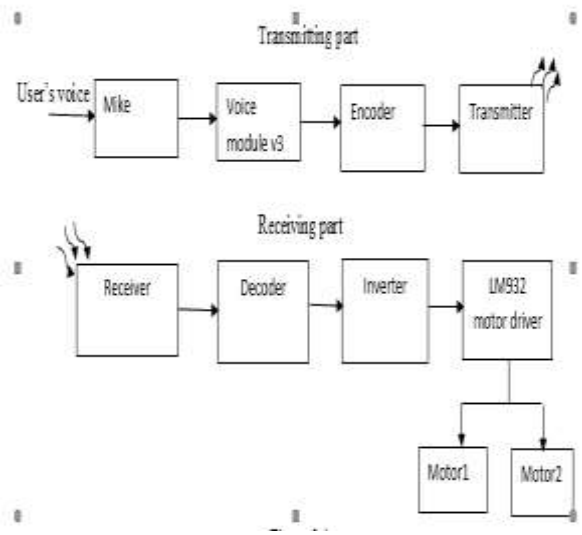


Fig. 3.1

3.1 VOICE MODULE V3:

ELECHOUSE voice recognition module V3 is a portable and simply controlled speaking recognition board. It can support maximum 80 voice commands. There is any sound that can be trained as a command for using the module. End user have to trained it first and then use this module by input voice command given at that time of training the module.

Fig. 3.1.1

***3.2 HT12E Encoder IC*:**

The encoder is used to encode the data that comes from the voice recognition module v3 throws the transistors and simply it converts the parallel inputs into the serial outputs. This encoder IC contains 8 address bits and 4 data/address bits. After encoding the data this is given to the transmitterpart to transmit to the receiver

Here pins from 1 to 8 (A0 to A7) are the 8 bit address pins for inputs and pin 9 is for ground. The pins from 10 to 13 are the 4 bit data/address bits for input. Pin 14 is for transmission enable (active low), pin 15 is for oscillator output, pin 16 is for oscillator input, pin 17 is active high and pin is for supply voltage.

3.3HT12D Decoder IC:

This decoder IC is used to decode the data that comes from transmitting part to receiver part's decoder IC. It converts the serial input data into parallel data. It decodes the serial data and address that is received by the RF receiver, into the parallel data. Now the input data codes are decoded when there is no error or unmatched codes are found.

Here the pins from 1 to 8 and 10 to 13 are 8 bit address pins and 4 bit data/address pins respectively. The pin 9 is for ground (0 volt) .The pin 14 is for serial input, pin 15 is for oscillator output, pin 16 is for oscillator input, pin 17 is active high and pin 18 is for supply high.

A prototype of voice operated wheelchair has been designed with the interfacing circuits. This wheelchair uses motors which are specially designed for the purpose to move the wheelchair in the desired direction with a load. The motors of this wheelchair normally have high torque and high revolution per minutes (rpm). The below given figure shows the hardware design of the voice operated wheelchair with the required interfacing circuits

Fig. 4

5.Conclusion:

Voice operated wheelchair prototype has been presented. The efficiency to detect the voice commands and to control the wheelchair is increased. The proposed v3 module based voice operated wheelchair becomes easy to use for handicapped persons as it operates with voice command.This voice operated wheelchair makes the handicap person self dependent through the self control movement . A person who is disabled with legs and arms can use this voice operated wheelchair if he is able to speak.

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