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Voice Controlled Robot Writer for Physically Challenged

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Abstract

Voice Controlled Robot (VCR) is a mobile robot. The robot's action can be controlled by the user through mobile phone by giving specific person's voice commands. The robot will receive the voice commands from the person through the microphones and then the robot will execute the actual work. This project is specially made for physically challenged students who can not to write the exams like others. In this project the voice message will be recorded using the application in the mobile phone , then the voice that is recorded will be sent to arduino board by the help of Bluetooth. Through which the instructions will be sent to the robot . The robot writer will function based on the received Voice command.

KEYWORDS:VCR,Buletooth.,Robot write,Ardunio board.

1.INTRODUCTION

Robot controlled by voice using mobile phone is very useful for physically challenged persons. It is also very useful in industries and at places where human life is endangered. Specific voice commands given to VCR will control its motions. Generally 5 voice commands 'Run', 'Stop', 'Left', 'Right' and 'Back' issued by a particular user are used by the speech recognition software running on a PC. It is capable of identifying all these commands. After processing the speech, the necessary motion instructions are given to the mobile platform via a RF link**.** It gives exact concept of controlling a robot by voice. VCR is capable of understanding and synthesizing human's speech for communication. A voice recognition unit built around a high speed processor that ensures various function of the system is performed by voice command. The speech recognition software used in VCR is speaker dependant. The special feature of the software is the ability of the software to train itself for the voice ccommands for a particular user. The graphical user interface running along with the software provides a very convenient method for the users to train. It also provides many other facilities in operating the robot. In the present project we have developed a robot writer using AT mega 2560 board.

II. HARDWARE DEVELOPMENT

The Hardware Development board used here is ATmega 2560 development board which has 15 PWM channels needed to drive the servo Motors. In addition to this there is a camera which is mounted on the head of the robot which will give live recording of the area. The speech recognition circuit functions independently without using the robot's main intelligence [CPU]. This is good since it doesn't take any of the robot's main CPU processing power for voice /word recognition. The CPU merely takes the speech circuit's recognition lines occasionally to check whether a command has been issued to the robot or not.. The software part is done in Arduino IDE using Embedded C.

A Few of instructions recommended for operation are listed as:

- STOP,
- FORWARD,
- BACKWARD,
- RIGHT,
- LEFT,
- SLOW,
- FAST,
- OK,
- UP,
- DOWN,
- CLOCK,

- ANTICLOCK,
- CLOSE,
- OPEN

These are the functions by which a robot is controlled by the specific person's commands. By using the above 14 commands a robot can do any work ,which a normal person can never do.

To work with this system we have to design some application of android. The application consists of android phone with Bluetooth receiver.

In the model, an android application for voice recognition is developed. This application converts the voice command to text and sends it to the robot via Bluetooth. The robot receives the voice and compares it with the programmed commands in the microcontroller and executes the directed action

II.1 ARDUINO BOARD

Arduino is an open-source platform used for building electronics projects. Arduino consists of a physical programmable circuit board referred to as a IDE (Integrated Development Environment) that runs on your computer. It is used to write and upload computer code to the physical board. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware in order to load new code onto the board . One can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn and write program. Further Arduino uses a simplified command .The voice command will be converted into text and is shown in the following diagram .

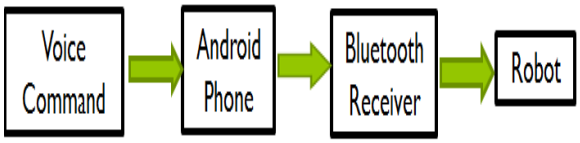

Fig.1 Block diagram showing voice command to Robot

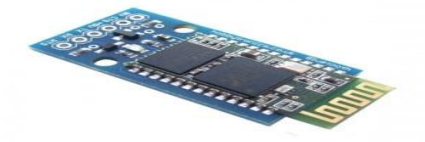

Fig 2 ATmega 2560 development board

II.2 CONTROLLING OF ROBOT

In this system the robot is controlled by arduino board containing the Atmega 2560 microcontroller. The text sent to microcontroller from mobile phone will be compared with pre programmed command such as left, right, up, down etc. The microcontroller gives the commanding signal to both the wheels through motor driver. when user gives command left then it stops the left wheel and right wheel will move then robot moves in right direction same as when we have to move robot in right direction then right wheel will be stop and left wheel will move then robot will turn right, When we have to a move sharp turn then one wheel move in clockwise direction and another wheel will move in anticlockwise direction then robot will take sharp turn.

We have used the following softwares for robot's functioning

RobotWare is at the heart of the system and features a number of optional plug-ins designed to increase functionality for robot users. For example multitasking, transfer of information from file to robot, communications in th external systems or advanced motion tasks.. SafeMove is an electronics and software based solution that ensures safe and predictable robot motion.

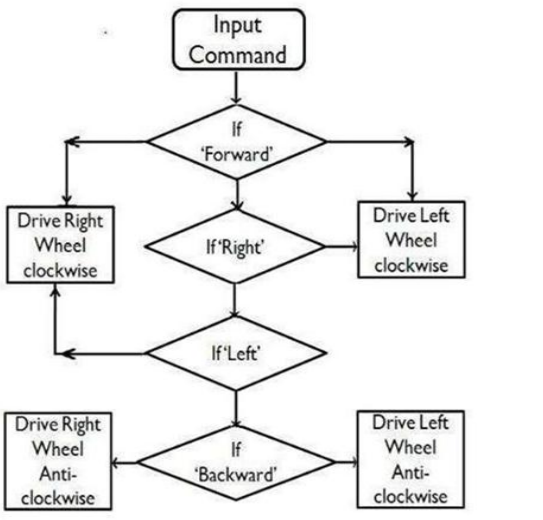

Fig. 3

II.3 Bluetooth module interfacing with pic microcontrollers,

In this section we explain how to interface Bluetooth module with microcontrollers.How to

select most suitable **Bluetooth** module for our project in which we want to use Bluetooth for wireless communication. Many of you are already familiar with Bluetooth and its working. Because you use Bluetooth daily for sending and receiving data from one device to another in your mobile phones or computers. But Bluetooth have many other application in wireless audio and video controllers. The following is the Algorithm used for VCR writer

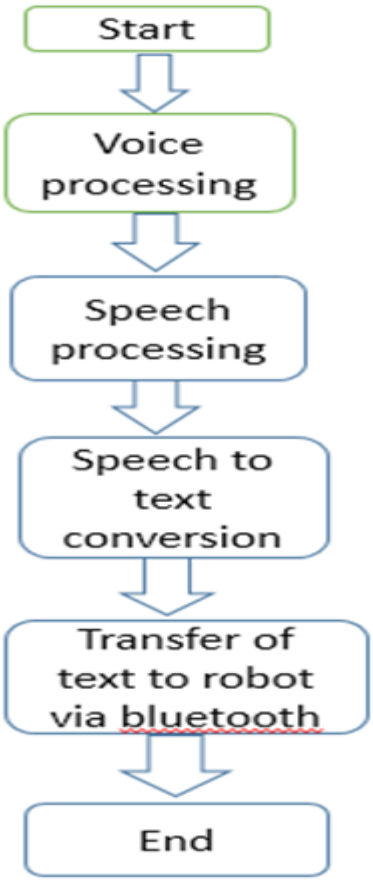

Fig.4 Algorithm for voice controlled robot for physically challenged students.

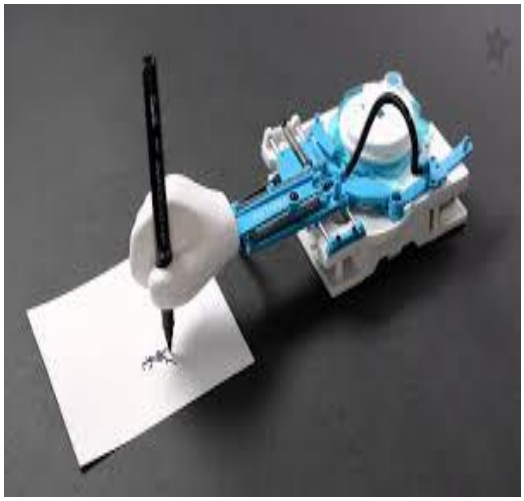

Fig. 5 Picture showing VCR writer writing letters.

III. RESULTS AND CONCLUSION

The working model was tested on Arduino and the screen short of the program is shown in the above figure. The Function of robot is fully controlled by the voice of from mobile. Phone. This can be also useful to execute other jobs for the person who is physically challenged in addition to writing.

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