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Voice Control Robot

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Abstract: Voice controlled robotic system is very useful and beneficial in our areas where there is high risk for humans to enter. This project was developed in a way that the robot is controlled by voice commands. An android application with arduino is used for required tasks. The connection between the android app and the robot is facilitated with the WiFi technology. Voice controlled robotic system is controlled through voice commands received via android device. The voice commands are processed in the real-time using a WiFi module. This robot can perform different movements forward, backward, left, right & stop relocated an object from one place to another and can also develop a conversation with human using the voice commands.

Keywords: WiFi module, android based smartphone, arduino, voice control.

I. INTRODUCTION

Our aim is to make a robot vehicle which can be controlled by the voice command of a person. A voice controlled robotics which can controlled using specific voice commands. Speech to text functionality is used to convert voice commands to text which are then sent to arduino through WiFi communication. The voice commands are perceived using an android application which converts speech to text conversation. This text is in the form of the string. We accept character by character from the serial buffer sent by the android app and combine them to form a string. Then the code compares it to the command. It is then sent to arduino via the WiFi module. In this voice control robotic system our aims the achieving the fulfil the all tasks user through various commands. Also, the commands that may be needed in the case of interactive correction of actions are considered. The android application is connected to WiFi module, which is directly connected to arduino Uno. If it matches, the command for the robot is carried out. For example, if the string we received is “forward”, the robot will go to the forward. The robotic vehicle can be controlled wirelessly via voice commands directly from the user conversation. The robot can move forward, backward, left, right and stopped. The hardware part is the consist of mechanical design in the robot, all the electronic device to properly drive the robot joints. The voice command was given to the android phone that converts speech to text and it communicates with the control through WiFi module. The voice commands given by the user through the android mobile phone is transferred to the robot by WiFi network. The robot will rotate 360 degree by taking a snap at each interval of time and the snap is analysed. Our project one another content is adding is the wireless remote controlling robot are chosen one is voice through and another is app through wireless remote controlling robot. Wireless remote controlling robot is all commands are same in the voice controlled robot. The wireless remote control robot is work for the touch of the command box the robot is worked in properly.

Wireless remote controls today have mainly based on these technologies:

I. INFRA-RED TECHNOLOGY: it is the most commonly used for the controlling mechanism in robotics. An infra-red remote, also known as a transmitter, uses infra-red light to send the signals to the receiver or robot.

II. RADIO FREQUENCY TECHNOLOGY: these remote controls use the radio waves to transfer the codes via the transmitter. Modern satellites television system uses these type of remotes.

III. SPEECH RECOGNITION TECHNOLOGY: it is the toughest to implement but is a very important asset to increase the ability to interact with the robots.

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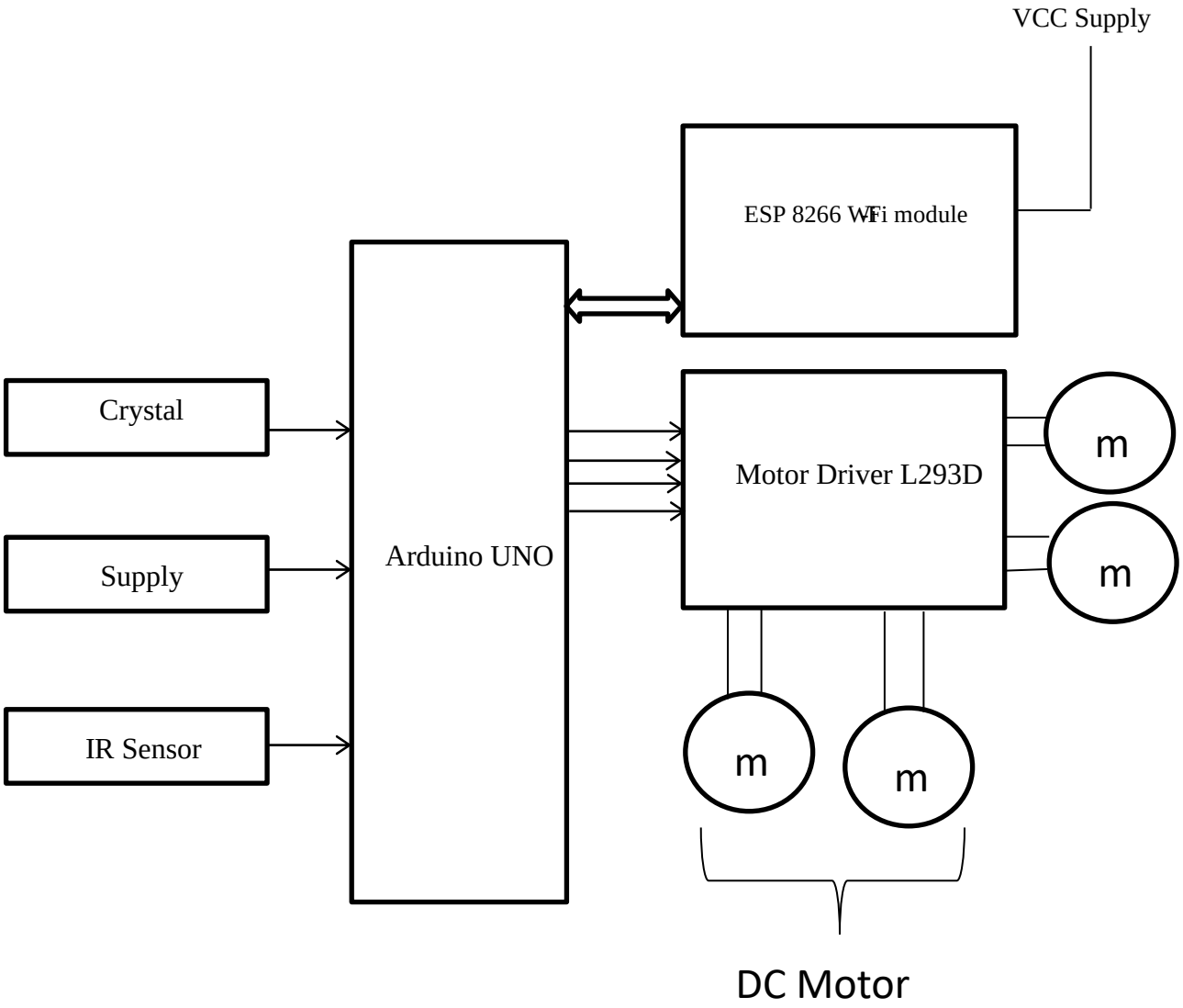

Figure 1. Block Diagram of voice control robot

The robot is design with the help of Arduino and Wi-Fi module the Arduino circuit is interfaced with DC motor 12 volt operating voltage & the L293d driver IC is used to operate the Motors the Arduino circuit is interfaced with Wi-Fi module. The Wi-Fi module will receive commands from the application and the application will be allowed to specific voice commands. The voice command will be given by the Google Synthesizer and then it will be processed from our application and the application will convert that command into specific binary digital signal. The Digital Signal will be forwarded by via the app & to Wi-Fi module. The Wi-Fi module will respond the application & then it will forward command to Arduino. Then Arduino recognize the command for which is to be operate that means if your command is forward then specific forward will be having a specific key, then that key will be converted into binary code and binary code will be recognized by Arduino.

II. PROBLEM STATEMENT

The objective of the project is to allow users to control robotic vehicle remotely by voice commands using mobile application. The robot is generally used by the mobile application and other features but as per advanced requirement we are using voice controlled robot which will follow the command for the voice and then as per the completely will be follow the action.

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III. PROPOSED SOLUTION

I. As mentioned above Voice Commands are proposed by phone, and speech-to-text conversion is done within the app using Google Synthesizer technology. The text is then sent to the receiver side via Wi-Fi. Text received via Wi-Fi module is forwarded to the Arduino Uno board using UART serial communication protocol. Arduino code checks the text received. Whenever the text is a matching string, Arduino controls the movements of the robot accordingly in forward, backward, turning right, turning left & stop.

II. Arduino can connect to Laptop to monitor serial communication and check the working process and the words received by the Wi-Fi module.

IV.PROPOSED WORKING

The robot is design with the help of Arduino and Wi-Fi module the Arduino circuit is interfaced with DC motor 12 volt operating voltage & the L293d driver IC is used to operate the Motors the Arduino circuit is interfaced with Wi-Fi module. The Wi-Fi module will receive commands from the application and the application will be allowed to specific voice commands. The voice command will be given by the Google Synthesizer and then it will be processed from our application and the application will convert that command into specific binary digital signal. The Digital Signal will be forwarded by via the app & to Wi-Fi module. The Wi-Fi module will respond the application & then it will forward command to Arduino. Then Arduino recognize the command for which is to be operate that means if your command is forward then specific forward will be having a specific key, then that key will be converted into binary code and binary code will be recognized by Arduino. The Arduino will operate that command and then it will give the signal to the L293d motor Driver IC. The motor driver IC will convert the binary signal into analog signal. The analog signal give to the dc motor and then dc motor will be operate as per given command if the command is coming for the forward then all motors will be rotating clockwise direction. The end tom end 3d having the logic voltage that is 0 1 If it is given then Motors will be operated with clockwise direction. 10 is given then motor will operate anticlockwise direction & if 00 is given then motor will stop. All the command will be processed by Arduino and given to motors as per the commands it will be operate the robot.

V.SOFTWARE

Application is designed in Java. It is link with Google assistant. Google Assistant will filter and recognize speech. Then the speech is specifically provided for keyword for recognizing speech we used Google Synthesizer.

VI. RESULTS AND DISCUSSION

The following directions of voice commands supported which the various directions of motions possible within the DC motor are:

I. **REVERSE:** Both are motors within the reverse direction. II. **LEFT:** Left motor in backward direction/Right motor within the forward direction.

III. **RIGHT:** Right motor in backward direction/Left motor within the forward direction.

IV. **FORWARD:** All motors are within the forward direction and rotate at high speed. V. **STOP:** All the motors are stopped.

VII.CONCLUSION

The “Voice Controlled Robot” project has many applications in present and future. The project can be made effective by adding features to it in the future. this kind of a robot will be used in wide areas such as military, home security, rescue missions, industries, medical assistance, hospital, office, commercial spaces etc. and use multiple applications robot in utilize. We were successful in implementing a simple model of voice controlled robot using the available resources. The implementation of this project is easy, so this robot is beneficial for human life. The Voice Control Robot is useful for disable people and monitoring purpose. As per given requirement the robot will be follow specific action from the voice command and the voice command will be operated by the Arduino and as per the requirement and operate our robot for any direction for those who was left,right,start and stop. It works on simple voice command, so it is easy to use. Also We can implement web cam for security purpose. The voice recognition software has an accuracy and for identify a voice command . it is also highly sensitive to the surrounding noise.

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