VOICE CONTROL ROBOT USING ARDUINO PICK AND PLACE OBJECT

PAWAR HARSHAD
Department of ECE, S.B.Patil College of Engg., Vangali, Maharashtra, India

JAGTAP AMOL
Department of ECE, S.B.Patil College of Engg., Vangali, Maharashtra, India

KAMBLE DNYANESHWAR
Department of ECE, S.B.Patil College of Engg., Vangali, Maharashtra, India

PROF. AMOL C. BHOSALE
Department of ECE, S.B.Patil College of Engg., Vangali, Maharashtra, India

ABSTRACT

A rescue robot is a robot that has been designed for the purpose of aiding in most rescue workforces. In most of common circumstances that skill rescue robots are mining fortunes, urban ruins, and imprisoned situations and blasts. This robot will help us in these situations by helping humans. The major objective of this project is to control the robot by using voice commands and to use in disaster regions. It is aimed for the users to control a pick and place device through voice commands. Here the user can control all the movements of robot through voice commands to remove the objects in disaster regions. It uses a microphone to convert the given voice commands to electrical signals and this signal is recognized using voice recognizer by means of a voice sensor. This sensor is known as the VR Module. It will produce an output which is used by a controller to produce a control output. This output will drive the motor, thus robotic action takes place. It consists of L293D IC which will as a driving mechanism of the pick and place robot. Also, it has servomotor that helps for movement of arms. The two micro servos are used in gripping the objects at a distance. The VR module is used here to recognize the voice and give the output to microcontroller. If the signal is same with that of the trained signal in keypad, the servos will work according to it.

KEYWORDS: AT mega 328, L293D

INTRODUCTION

Robotics is advancing rapidly in all areas. Presently various Industries is moving from automation to robotization to increase productivity and also to deliver uniform quality. Currently, everyone find substitutes for himself to carry out his orders and also to work in a hostile environment. Robot and robot like manipulators are now commonly used in hostile environment, such as at various places like atomic plant, chemical plant, bomb detection areas, etc. One type of commonly used manipulator in Industries for various applications is robotic arm also known as robotic manipulator Now a days robots are having wide applications in various fields. In many industries robots are used for performing different functions. Robots are more accurate and efficient as compare to human being. Use of robots in industries can increase the quality of products and their production rates. As compare to earlier days, today robots are used in various areas such as defense medical fields, in industries etc. Many areas of the world are getting affected due to natural calamity. Disasters are exceptional unstoppable events that are either man- made or natural. Voice controlled robot is an interesting project, mainly used for industrial and surveillance applications. This is a system which will act automatically when the voice command is reached. These voice commands should ensure the various operations that is to be performed. Our project is aimed to see the working of a pick and place device using voice commands at calamity affecting regions.

1.1 OBJECTIVE

The main goal of this project that the cost per hour to operate a robot is a fraction of the cost of the human labor needed to perform the same function. Without risking human life or limb, robots can replace humans in

some hazardous duty service. Robots can work in all types of polluted environments, chemical as well as nuclear. They can work in environments so hazardous that an unprotected human would quickly die.

BLOCK DIAGRAM

The implementation of proposed system mainly involves RF Tx and Rx, Motor Driver, using ARDUINO AT Mega 328 microcontroller based. The block diagram of the system is shown in Figure
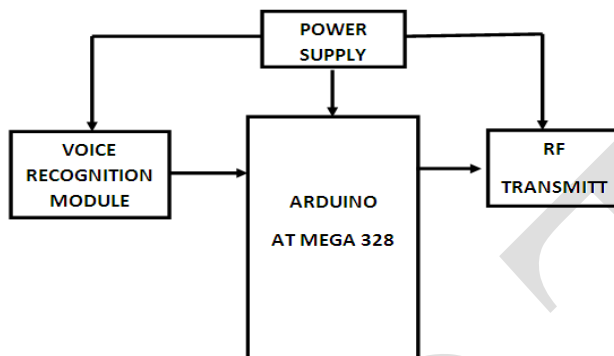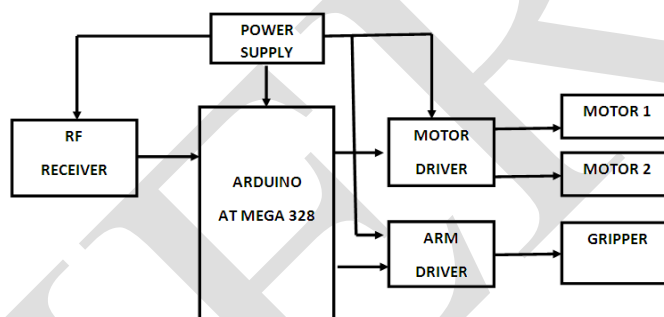

Fig -1: Transmitter Block Diagram

Fig -2: Receiver Block Diagram

2.1 ARDUINO

The ATmega328/P provides the following features: 32Kbytes of In-System Programmable Flash with Read-While-Write capabilities, 1Kbytes EEPROM, 2Kbytes SRAM, 23 general purpose I/O lines, 32 general purpose working registers, Real Time Counter (RTC), three flexible Timer/Counters with compare modes and PWM, 1 serial programmable USARTs , 1 byte-oriented 2-wire Serial Interface (I2C), a 6- channel 10-bit ADC (8 channels in TQFP and QFN/MLF packages) , a programmable Watchdog Timer with internal Oscillator, an SPI serial port, and six software selectable power saving modes.
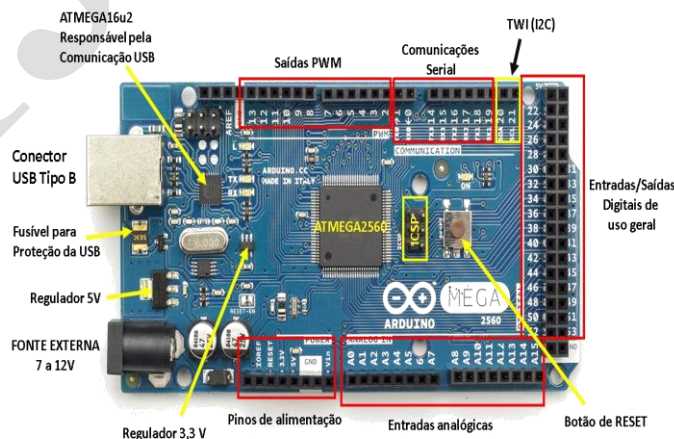

Fig 3: Arduino Board

2.2 VOICE RECOGNITION MODULE

The module could recognize your voice. It receives configuration commands or responds through serial port interface. With this module, we can control the car or other electrical devices by voice. This module can store 15 pieces of voice instruction. Those 15 pieces are divided into 3 groups, with 5 in one group. First we should record the voice instructions group by group. After that, we should import one group by serial command before it could recognize the 5 voice instructions within that group. If we need to implement instructions in other groups, we should import the group first. This module is speaker independent. If your friend speaks the voice instruction instead of you, it may not identify the instruction. Please note that speaker independence requires strictly good MIC. The MIC we supply is not good enough for it to be speaker-independent.
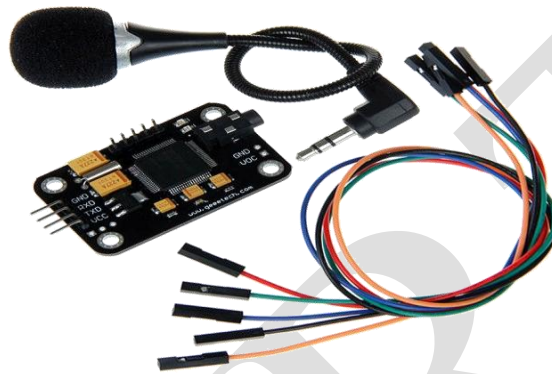

Fig 4: Voice Recognition Module

2.3 RF TX AND RX

This RF module comprises of an RF Transmitter and an RF Receiver. The transmitter/receiver (Tx/Rx) pair operates at a frequency of 434 MHz An RF transmitter receives serial data and transmits it wirelessly through RF through its antenna connected at pin4. The transmission occurs at the rate of 1Kbps - 10Kbps.The transmitted data is received by an RF receiver operating at the same frequency as that of the transmitter.

The RF module is often used along with a pair of encoder/decoder. The encoder is used for encoding parallel data for transmission feed while reception is decoded by a decoder. HT12E-HT12D, HT640-HT648, etc. are some commonly used encoder/decoder pair ICs.

Fig 5: RF TX and RX module

2.4 WORKING

The power supply3.3V to 5V to all the system. Voice Command is given to voice recognition Module v-3.It has three group and each group contain 5 Command. The voice recognition is connected to the UART of Arduino At mega 328. At transmitter side HT12E is use to encode the voice command and transmit the data to receiver. At receiver it contain the RF receiver which is HT12D to decode the data and send to Arduino to drive the motor using motor driver IC LD29D.
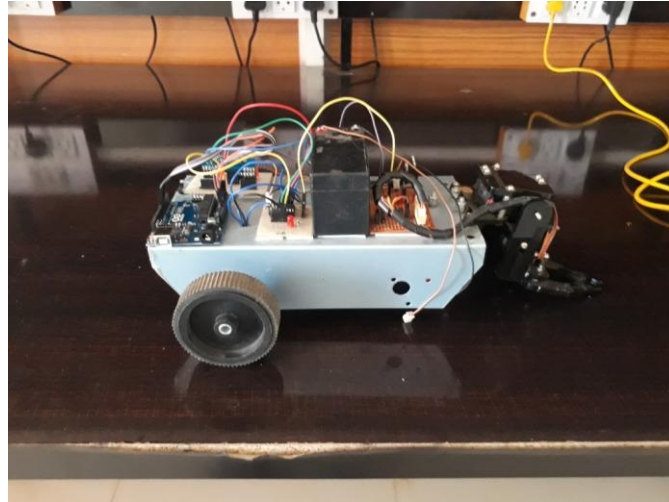
ARCHITECTURAL MODEL

Fig -6: Architectural model

CONCLUSIONS

We learned the basics of some new technologies including Arduino programming and easy VR sensor. This project also helped us in learning how to manage a project. We have designed the voice command based pick and place robot which can act as calamity res- cue robot. This robot can work with the given voice commands. But, only standard commands can be used here to perform the robotic operation. Standard commands means the trained commands. For performing the robotic operation we will train the robot to perform different operations. Since, difficult portion of the construction was voice recognition of input commands, voice controlled robotic arm for picking and placing an object was successfully designed. The robot control was found to be user friendly.

REFERENCES

1) Harshit Gulati, Shriyansh Vaishya and Sreehari Veeramacha- neni, *Bluetooth and Wi-Fi Controlled Rescue Robots Birla Institute of Technology and Science, Pilani, Hyderabad Campus Shameer- pet Mandal, Hyderabad, 500078, India.*

2) Adel Aneiba, Khaled Hormos, *A Model for Remote Controlled Mobile Robotic over Wi-Fi Network Using Arduino Technology De- partment of Computer Networks and Communication Faculty of Information Technology, Benghazi University-Libya.*

3) Ritika Pahuja, Narender Kumar, *Android Mobile Phone Con- trolled Blue-tooth Robot Using 8051 Micro-controller International Journal of Scientific Engineering and Research ISSN (Online): 2347-3878 Volume 2 Issue 7, July 2014*