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Paper Authors

AJAY M, B RANJANA, PRAJWAL P, PRATHAP KUMAR KB

RRCE, Bengaluru.

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ANTICOLLISION AND VOICE CONTROLLED ROBOT WITH ROBOTIC ARM USING ARDUINO

[1*]AJAY M, [1]B RANJANA,[1]PRAJWAL P, [1]PRATHAP KUMAR KB

[1*]Assistant professor, Department of ECE, RRCE, Bengaluru.

[1]Student, Department of ECE, RRCE, Bengaluru.

ABSTRACT

Voice Controlled Robot is a motile robot where its movements and actions can be supervised by the user by giving specific voice command by the user. The voice command is received by a smart phone and when this command is acknowledged, the voice module directs voice command to the microcontroller. The voice command received by the microcontroller is examined and takes suitable action.So this project put forward is a inbuilt self-regulating robot such that it stops and waitsfor user's input whenever an obstacle comes in its path and it acts according to user's command received,so it protects the robot from any physical havoc. It can be designed by using ultrasonic sensors to develop an obstacle avoidance robot. Ultrasonic sensors can spot any obstruction in its path and sends this information to the microcontroller.Based on the information received, the microcontroller actuates the motor and thus controlling the robot. A robotic arm is installed which is also voice controlled which can be used to pick and place an object or small obstacle that may be present in the path of robot.An alternate control system of controlling the robotic vehicle through joystick is adopted in order to overcome the situation and environment where internet connectivity is not possible.

KEYWORDS : Voice controlled Robot [VCR].

1. INTRODUCTION

As per the Indian Government's documentation of road accidents more than 350 people die every day in India. Here the paper put forth will use the idea of voice controlled robot using Arduino mega and wifi module which avoids road accidents ensuring security. The advanced world is much more reliable on smart phones and we link automobiles with smart phone.In places where human penetration is at risk, we can use this voice controlled robot. The user's voice command received by the android application guides the robotic vehicle. The combination of wifi module with controlling unit is attained using wifi module to trap and read the voice message. The operation of the voice control depends upon the voice command received by the android application. Using google assistance as the android application is beneficial because google assistance is the enhanced version of the android application (voice input)which autocorrects the input voice command. The microcontroller analyses these commands and actuates the motor through motor driver to move forward,backward, right, left directions and arm motions. The ultrasonic sensor fixed to the robot can automatically sense and avoid hurdles in its path which makes the robot an intelligent one. Obstruction avoidance aims at movement of vehicle based on sensorial information.

2. RELATED WORK

The Arduino Based Voice Controlled Robot proposed by Yoo-Ki Cho,Jong-Baem Won[1] says Voice Controlled Robot (VCR) is a robot in which it takes voice command input through microphone and processes it in its

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microcontroller and does the appropriate action as specified by the voice command by actuating the motors through the motor drivers.Voice Controlled Robotic System using Arduino Microcontroller proposed by D'Mello,Lee McCauley and Markham[2] says Voice controlled robotic system is very beneficial and it can we sent where human penetration is very risky. The voice command is received from the voice module and sent to the robots microcontroller through Bluetooth. This communicated message is processed in the robots microcontroller and doing appropriate action or motion. Obstacle Avoidance Robot proposed by Praveen Blessington, B.T.P.Mahadav, M.SagarBabu [3]says how the robotic vehicle has been designed without use of a remote and the intelligence of taking independent decisions when it encounters or detects an obstacle ahead of it.Multiple Motion Control System of Robotic Car Based on IoT to Produce Cloud Serviceby A. R. Krishna, G. S. Bala, A. Sastry, B. B. Sarma and G. S. Alia[4]says how we can control multiple motion of a robotic vehicle with the master microcontroller as RaspberryPi and with slaves Arduino Uno.

3. PROPOSED METHOD

The basic idea of the proposed technique is controlling the robot through the voice command which is given as input to the robot. Here we use google assistance to take the voice command input and control the robot. Initially in the database we have some commands stored and assigned for as per the variables in the program written by the user. Whenever a voice input is given this voice command is checked in the database and if present it will be stored temporarily and is fetched by the wifi module and sent to the Arduino mega where it is processedwhich then actuates the respective motors.
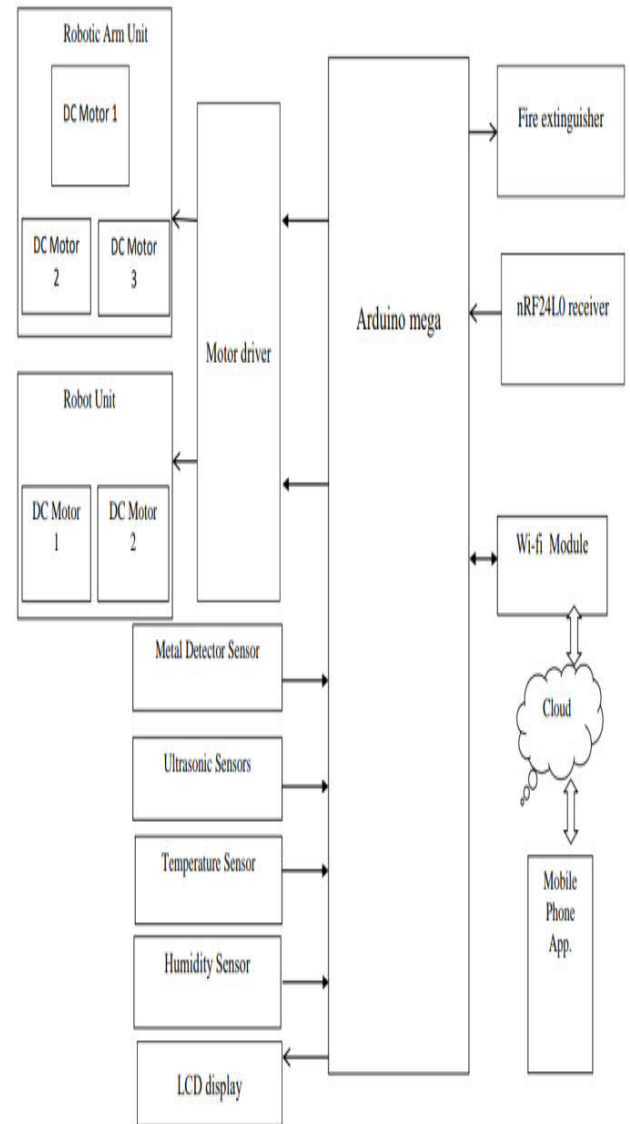
Block diagram:

Fig 1. Block diagram

We need to select the mode in which the robot must be operated. There are 2 modes, joystick mode (wireless) and voice controlled mode (internet). After selecting a particular mode we can control the robot in voice or joystick as the mode selected.

We have 2 modes for controlling because when the internet connection is not possible in some places we can have an alternate wireless controlling (joystick mode) access for the robot. Back up
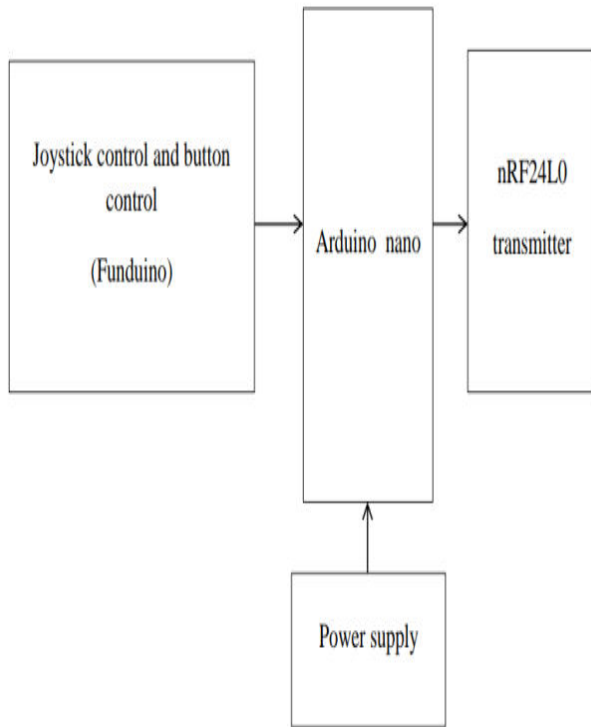
controlling system's block diagram:

Fig 2. Backup control system block diagram

As soon as the robot is powered up all the sensors starts to sense and continuously send the sensed information to the Arduino mega. This information is then processed and sent to LCD display on the robot and on to the android application via wifi module.Then for controlling the robots movement we have to select the mode in which we must operate. After selecting the mode based on the voice or the joystick, the robot's particular motor will be actuated through Arduino mega and robot starts behaving accordingly.

If the obstacle happens to be present in the path of the robot, the robot will stop by sensing through ultrasonic sensors (tuned for 20cm range) and waits for the users next action or command for the robots movement. During all these activities all the sensors will be active and continuously monitor the environment and will keep updating the temperature, humidity, presence of obstacle and metal detection and will keep updating on the android application as well as on the LCD display.
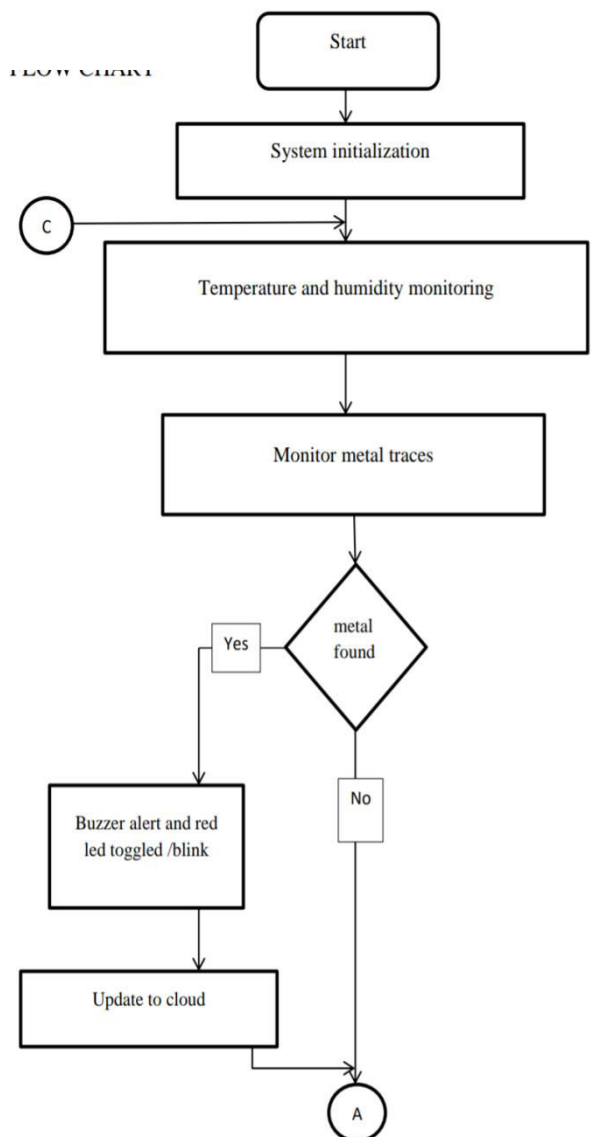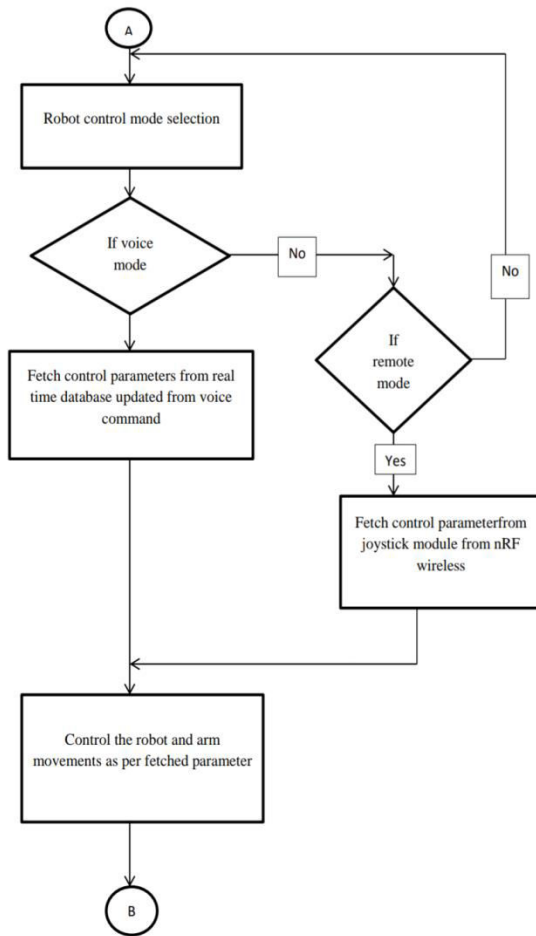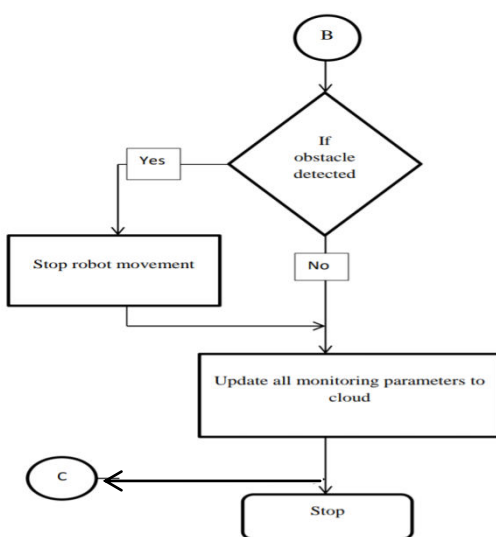
Flow chart:

Fig 3. Flow chart-1

Fig 4.Flow chart-2

Fig 5. Flow chart-3

4. RESULT

According to the owners instruction the automobile will start to move forward, backward, right, left. An ultrasonic sensor will sense for an obstacle. By installing 2 ultrasonic sensors in the front and 1 ultrasonic sensors in the back for an automobile, covering more degrees in the front , it will avoid accidents by automatically stopping the vehicle and waits for the owners instruction for the next action. An android application connected to a wifi module ensures security of the automobile. Pick and place arm will be voice controlled too. The android application gets updated as soon as there is a change in parameter.
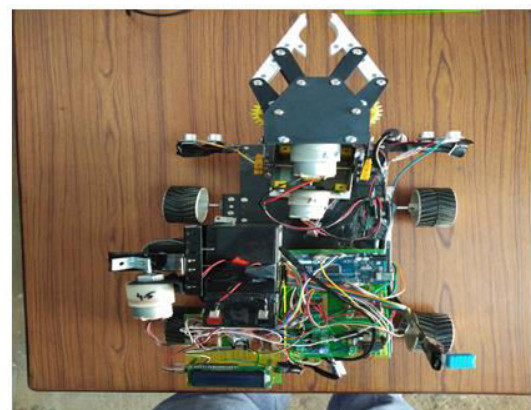

Fig 6. Android application for monitoring.

Fig 7. Top view of the robot.
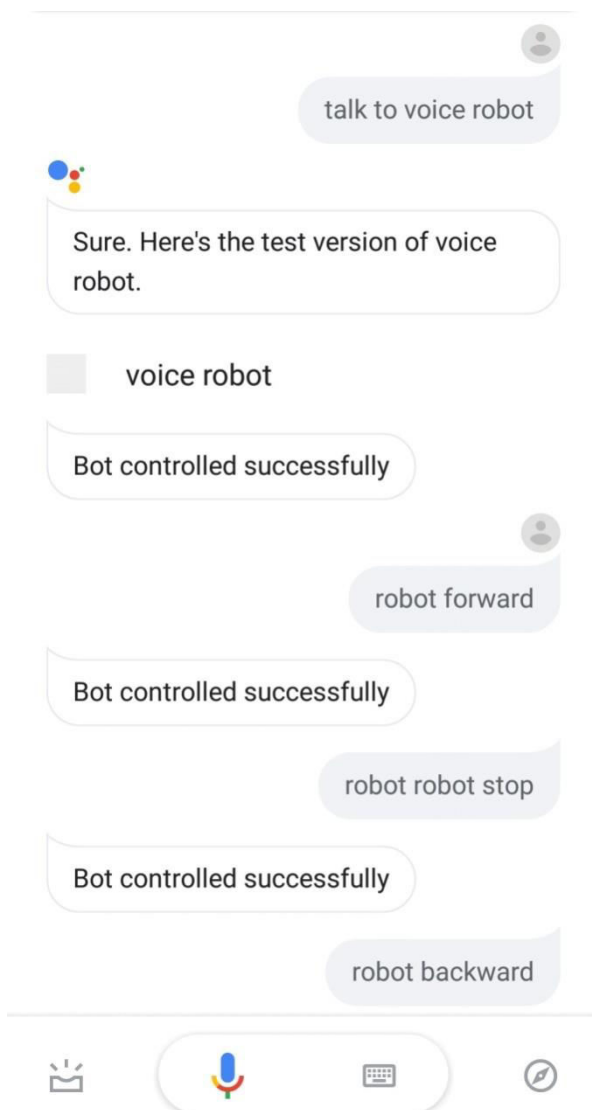
Fig 8. Pick and place arm in action.

Fig 9. Google assistance taking voice command input

5. CONCLUSION

The robot which we have built moves forward, backward, right and left based on the input given to it. The main aim of this project is to build an independent self-governing robot which smartly finds the obstacle in its path and redirects accordingly. We can say that voice controlled robot will surely be future market. This robot will replace many industrial and domestic robot those are used for domestic purposes. This robot can be introduced in industries, military, defense, research purposes, etc.

6. REFERENCE

[1] A. K. and R. C. , "Voice Controlled Robot," INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN TECHNOLOGY, vol. 1, no. 11, pp. 338- 344, 2014.

[2] A. D. A. P. S. N. and L. R. , "Three way controlled android Smartphone based," International Journal of Advanced Research in Computer and Communication Engineering, vol. 4, no. 9, pp. 212-216, September 2015.

[3] K. K. and D. J. S. , "ARDUINO BASED VOICE CONTROLLED ROBOT," International Research Journal of Engineering and Technology (IRJET), vol. 02, no. 01, pp. 49-51, March 2015.

[4]"Arduino," [Online]. Available: www.arduino.com. [Accessed 2015].

[5]Obstacle avoidance robotic vehicle using ultrasonic sensors for obstacle detection.
http://www.elprocus.com/obstacleavoidance-robotic-vehicle/