

VOICE CONTROLLED INTELLIGENT FIRE EXTINGUISHING ROBOTIC VEHICLE

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Abstract: Now a day's all the works of human beings are replaced by the robots. This Project describes the performance of Voice Controlled Intelligent Fire Extinguishing Robotic Vehicle. The vehicle is operated through User Voice instruction. The voice instruction as input allows the user to communicate with the robotic vehicle. It can also detect the temperature of the vehicle which is used as self-defending ability, so that robot is safe in dangerous condition. The voice instruction will move the robot in the required direction and the outfall of the water pump automatically controlled after some threshold values fireball system will be activated. The mode of communication between humans and Robotic Vehicle is through the Bluetooth. The entire system contains three sub modules: android (Bluetooth) section, transmitter section (TX) and the receiver section (RX). This vehicle can be used in Rescue operations where the possibility for service men to enter the fire prone areas is very less and dangerous.

Keywords: Voice control, Obstacle sensor, Android (Bluetooth) section, transmitter section (TX) and the receiver section (RX), Water pump, fireball.

I INTRODUCTION

A fire extinguisher vehicle is an active protection device which is acquires to extinguish or control fires often on emergency situations. The vehicle is operated through User Voice Command. The voice input allow the user to interact with the robot which is familiar to most of the people. It can sense the temperature which has self defensive ability so that these will be no harm for the robot. Previously Fire Fighting .By using an android application fireman can detect and extinguish the fire and can able to control it. At the same time robot can sense the obstacles and will avoid them by using Infrared sensors .Our project is demonstrated using an android application which can control operations of the fire fighting robot .Fireman can send instructions to robot through Bluetooth module which is mounted on vehicle itself. Smart phones has features of Bluetooth, through that fireman can control the movement of fire fighting robot.

It gives exact concept of controlling a robot by a voice Command. Robotic vehicle is capable of understanding and synthesizing human Command for communication and performs required functions. Few commands which have been used for operation of the robot are: GO, STOP, BACK, RIGHT, LEFT and for the operation of the pumping motor used are: OPEN and CLOSE. Voice control robots can be used for industrial and surveillance applications also it can be used for water sprinkling and cleaning purpose.

For fire detection it is using two sensors. One is temperature sensor and second is smoke detector. Vehicle is capable of controlling fire, avoiding obstacles. This Robotic vehicle can be used in dangerous operations during fire accidents where the possibility for service men to enter the fire prone areas is very less.

II RELATED WORKS

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III EXISTING SYSTEM

In Existing System the robot was made to the following

- To detect fire.
- Remote controller.
- Unidirectional movement.
- Buzzer

- [1]. In the first system it was purely dedicated towards detecting fire using sensor like LM35 and, Arduino Flame Sensors were used to detect the fire.
- [2]. It gave an advanced feature of using remote controlled fire operated robot to check the fire area but this had some disadvantages
- [3]. This robot was designed only to move in certain direction i.e. it can be made to move only in One direction.
- [4]. Atlas they added a buzzer to alert the people near them regarding fire accident.

IV PROPOSED SYSTEM

To develop a fire extinguisher vehicle system which works based on the voice commands of user. Detecting the Obstacles, fire, and hazardous gases. Involving in rescue operation where service men cannot enter. The system block diagram is shown in figure 1

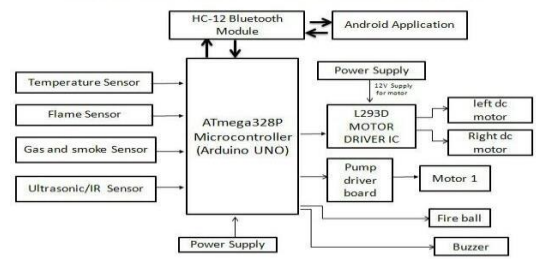


Fig 4.1 Block Diagram of Voice Controlled Intelligent Fire Extinguishing Robotic Vehicle

Microcontroller is the main controlling part of the system. Sensors are connected .The robot is designed such that it can also to move as per the command given through voice. The hardware is tested for accuracy and is used for extinguishing the fire. The merits of the project are that it will be helpful -Minimization of financial loss a threat to a human life Low cost long runs. Reliable and economical. Not sensitive to weather conditions and it can also be utilized by industrialists and commercial purpose .There are modules for implementation.

Obstacle detection Module:

- With the help of IR sensor it checks whether there is obstacle.
- If obstacle is detected within the certain range then the robot stops.

Fire detection Module:

- The robot will detect the fire in case of fire and will alert through visual and alarm.
- If the smoke and fire values in sensor at certain place are more than the set threshold then start the water sprinkler.
- If the smoke and fire values in sensor at certain place are more than the set threshold then start throwing fire ball.
- For industry purpose it will detect smoke and gas particles.

Fireman Module:

- The movement of the robot is being controlled by using android phone.
- The fireman needs to activate the obstacle detection module on the robot which will allow fireman to control the situation.
- The fireman can set the threshold value for that particular place like industry.

V FLOW CHART

The sequential flow of the fig 9 gives the clear picture of the proposed system.

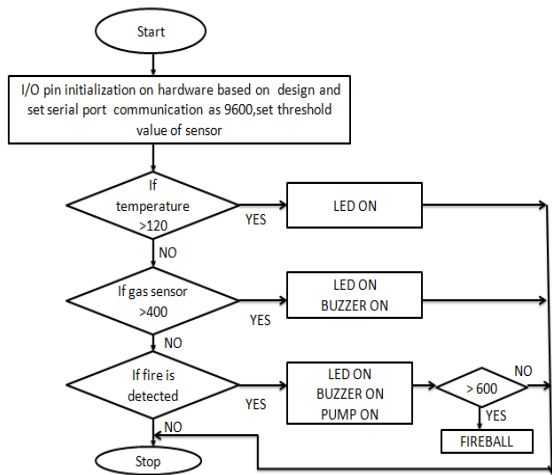


Fig 5.1 Flow chart

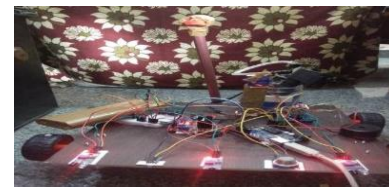
- Step 1: Start.
- Step 2: initialization the I/O pin on based on hardware design and set serial port communication as 9600, set, Threshold value of sensor.
- Step 3: Check If temperature sensor reading value exceeds threshold value ($temp > 120$), if NO go to step 5
- Step 4: Else, led is on
- Step 5: Check If smoke sensor reading value exceeds threshold value 400ppm ($smoke > 400$), if NO go to step 7
- Step 6: Else, led is on and buzzer gets activated
- Step 7: Check if flame sensor detects fire, if NO go to step 7
- Step 8: Else, led is on and buzzer gets activated, and water pump starts sprinkling and if the threshold value exceeds, Then fireball system is activated
- Step 9: Stop

VI EXPERIMENTAL RESULTS

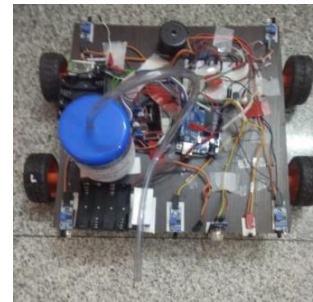
We have implemented innovative fire extinguishing vehicle which is shown in fig. And also android application is designed to control the vehicle remotely with the help of Arduino Bluetooth Control App and snapshot of it is shown in fig



(a)

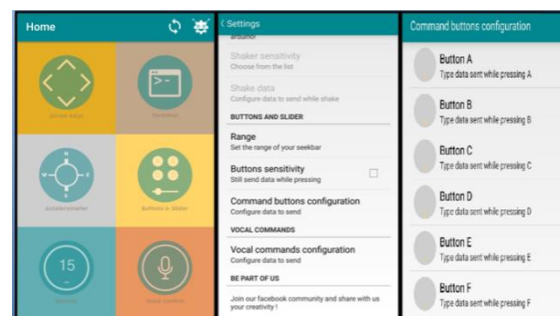


(b)

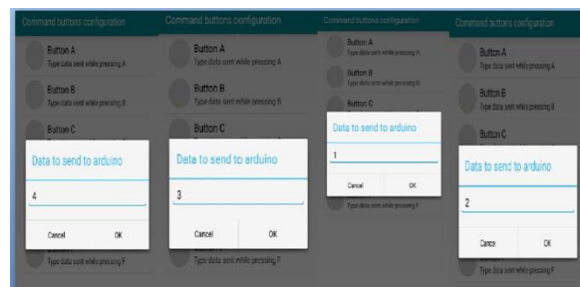


(c)

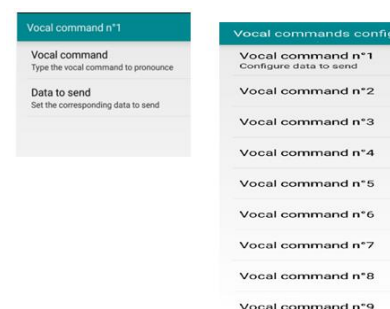
Fig 6.1 Voice Controlled Intelligent Fire Extinguishing Robotic Vehicle (a) experimental setup (b) working condition of sensor with fire ball and pump (c) overall development of vehicle



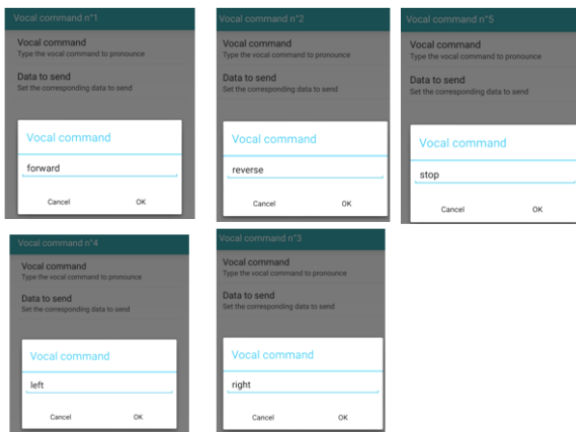
(a)



(b)



(c)



(d)

Fig 6.2 Voice Controlled Intelligent Fire Extinguishing Robotic Vehicle (a) screenshot of the APP (b) settings for voice command (c) voice control setup (d) command

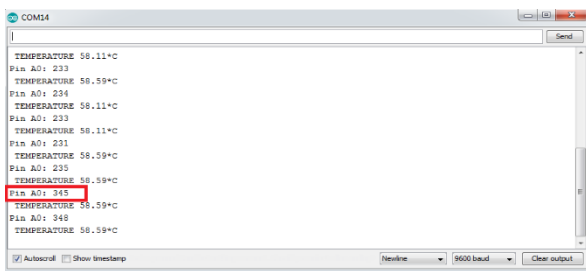


Fig 6.3 Voice Controlled Intelligent Fire Extinguishing Robotic Vehicle (a) smoke sensor exceeding threshold value.

VII CONCLUSION

We have proposed and executed Voice Controlled Intelligent Fire Extinguishing Robotic Vehicle. A fire extinguisher vehicle is a device which is used to extinguish or control fires often on critical situations. Based on the design principles and requirement, a prototype of the system for Voice Controlled Intelligent Fire Extinguishing Robotic Vehicle has been developed and implemented.

VIII SCOPE FOR FUTURE WORK

1. The robot detecting burnt area in 0m ~ 2m in radius.
2. Robot sense fire, and use extinguisher to fight the fire source with fireball.
3. The robot can rotate 360° and then robot can extinguish fire at angle 180° from the fire extinguisher nozzle.
4. The robot can extinguish fire from petrol, gasses leakages and electrical appliance.
5. This vehicle can be used for multi-purpose by configuring it for either domestic or commercial or

industrial application using the configuration software.

6. If GPS enabled, Robot can be controlled from remote station also.
7. A CO2 booster can be attached to make it powerful Extinguisher.

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