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Fire Extinguisher Robot

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Abstract— The Project is designed to develop a Low Cost fire Extinguisher Robot using Bluetooth technology for remote operation. Bluetooth HC-05 module is used for this purpose. The robotic vehicle is loaded with water tanker and a pump which is controlled over wireless communication to sprinkle water. At the transmitting end using push Bluetooth app, commands are sent to the receiver to control the movement of the robot either to move forward, backward and left or right etc. At the receiving end three motors are interfaced to the microcontroller where two of them are used for the movement of the vehicle and the remaining one to sprinkle the water during the fire. A water tank along with water pump is mounted on the robot body and its operation is automatically detected by the photodiode based (Light Intensity) Fire detecting sensor or MQ3 sensor for smoke detection. The whole operation is controlled by an ATMEGA328 series microcontroller. A motor driver IC, L293D is interfaced to the microcontroller through which the controller drives the motors.

Keywords— Low cost, HC-05, ATMEGA328, LM393/MQ3 sensor, L293D

I.INTRODUCTION

Previously Fire Extinguisher Robots were controlled by using different electronics devices but this reduces the scope of control of Fire Extinguisher robot. However, with the advanced techniques we can build the same robot by using android application to control the actions of the robot. With the help of such robots, fireman as work really decreased and movements of robot are so much effective. By using an android app fireman man detect the fire and can able to extinguish it. At the same time robot can detect the obstacles and can avoid them by using ultrasonic sensors.

Detection of fire along with extinguishment is a detrimental work that risks the health as well as the existence of a flame extinguisher person in the hazard but through utilizing a robot to execute fire detection and extinguishing in a fire-prone area, loss of lives and undesired incidents can be avoided in a considerable number. The day by day progress of advanced technology has made it feasible to develop different types of household and industrial robot and automation. The definition of the robot states that a system with the capability of executing human tasks or behaving in a human-like manner is regarded as robot. Continuous research and developments are going on for obtaining a reliable and effective method which can be enforced to develop a fire Extinguisher robot to detect and extinguish the fire to lessen the risk of injury to victims.

II.LITERATURE REVIEW

There were many firefighting robots being constructed nowadays using different types of Microcontroller. However, these are just restricted for prototype purposes. There are several reasons for this, some of them are: due to high cost, lack of effectiveness, due to complex construction, due to lack of detection of fire, etc.

A. Low Cost Bluetooth Controlled fire Extinguisher Robot Using Light Intensity Sensor it is easy to integrate with lighting system such as automatic lighting system.

B. Fire Fighting Robot Remotely Controlled by Android Application in which major deprivation and absence of important assets can be avoided.

C. A Novel Fire Extinguishing Robotic Vehicle Controlled by Android Application into this robot they used Touched screen.

III.OBJECTIVE

Increases the scope of control of fire fighting robot with the help of Bluetooth Technology.

IV.PROPOSED WORK

Proposed project is designed to build an android application which can control operations of the fire fighting robot. Fireman can send commands to robot through Bluetooth module which is mounted on robot itself. Smart phone has facility of Bluetooth, through that Bluetooth fireman can control the movement of firefighting robot. For fire detection it is using two sensors. One is temperature sensor and second is smoke detector. Fire extinguishing system will be get activated when fire detection system detects fire. Sprinkler will start sprinkling water when it detects fire. At the transmitting end android application is used and at receiving end two motors are interface to microcontroller.

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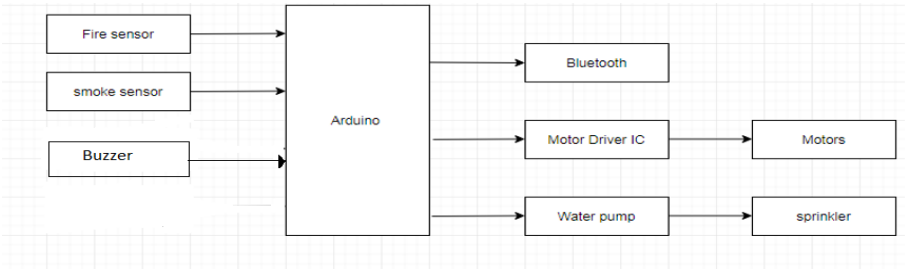
A. Theory

There are many firefighting robots being constructed nowadays using different types of Microcontroller. However, these are just restricted for prototype purposes. There are several reasons for this, some of them are: due to high cost, lack of effectiveness, due to complex construction, due to lack of detection of fire (which will be explained further in the paper), etc. This project is designed to overcome these drawbacks and created a prototype which will be very close to implement it in real time.

The project is basically composed of two different segments: one is the Bluetooth module interface to move the Robot. The other segment is fire detection and passing the signals from sensor to microcontroller and signals from microcontroller to motor driver IC to start sprinkling the water. The project construction is mainly done concentrating on the cost. So, the first segment for movement of the Robotic vehicle is done using Bluetooth module which is HC-05. As this is for the case of prototype, in real time implementation we can use Bluetooth range booster, which is cost effective comparative to the computer signals or any other IR signals or RF signal controlling. By using IR signal communication, it has to be in line of sight to obtain the effective communication, which is very much important for this project, as it is implemented in emergency situations, or else leads to the human lives loss along with financial loss. Hence, by considering all these cases, the usage of Bluetooth module is done. The controlling can be done by using any of the devices, here an android mobile is used, and as the availability of Bluetooth controlling apps is handy. Here for the prototype purpose we used an Bluetooth application downloaded from IOP Interoperability Profile.

B. Block Diagram



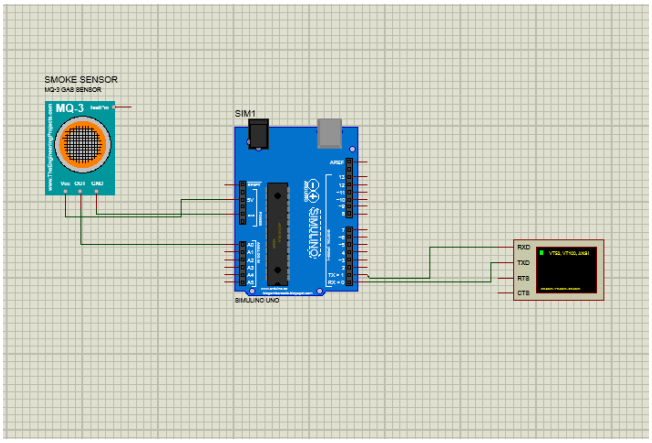
V. SOFTWARE SPECIFICATIONS

A. Arduino Software

Arduino IDE is used to program the Arduino UNO board. It is open source software used for writing and compiling the code into Arduino module.

B. Proteus Software

The proteus Design Suite is a windows application for schematic capture, simulation and PCB layout design.



CONCLUSIONS

This project can be further extended by including many other sensors, like Gas sensor, through which the existence of the gas leakage can be notified as notification to the mobile phone, through which we can avoid the occurrence of the fire accident. By implementing in such a way, this project can be used as emergency avoidance and clearance.

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Hence, we can conclude this document by noting the usage as follows: this project can be used as an emergency kit, where there is no need to wait for the arrival of the fire department, or an expert to start using the fire extinguishers to clear the fire.

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