

Fire Fighting Robot With Material Handling

Mr. Amar E. Chaudhary, Mr. Akash .S. Ingle², Mr. Jaywant G. Gavande³, Mr. Kunal S.Jadhav⁴,
Mr. Ravi Jadhav⁴

Professor, Dept. of Mechanical Engineering, PLIT&MS , Buldana, India ²,
UG Student, Dept. of Mechanical Engineering, PLIT&MS, Buldana, India ^{1,3,4,5}
Email-amarchaudhary14336@gmail.com

Abstract- We are working on the project that is Fire Fighting Robot with Material Handling. We are working on this project to improve the effectiveness of the extinguisher vehicle to extinguish fire in less time the fire has relation it is directly proportional to the time as fire takes more time it will do more damage and hazardous to the surrounding the our project will use to handle material during fire it would be able to carry out the people from fire. Fire can be catch up at any place due to open electric circuit or any reason due to fire can start. But there are different type of fire and that can be extinguish by different method we worked on the fire which could be extinguish by pressurized water. The robot is control by android application by using IR and RF signals. Which can be control robot from certain distance .Hence, The life security of the fire fighter will be increase. The Robot can reach that place where the fire fighter can't reach. The use of Robots at such a dangerous location will be the accurate use of technology for saving lives. This paper is to understand the robot working by using water to extinguish fire and its control system.

Keywords- Fire Fighting, Android, Fire Sensor, Extinguisher, 2 Dc motors .

I. INTRODUCTION

The Fire Fighting Robot is designed to search for a fire in a small floor plan of a house of the specific dimensions, extinguish the fire with the help of the sprinkling of extinguisher as a pressurized water , and then return with the material which should be rescue from the fire . The fire detection to be put into use is relatively free of false alarms, it is anticipated that it will not overreact in non fire simulations. The robot should do the navigation of the robot in every room step by step, finds the fire in a specific room, approaches the fire at a very fixed distance, extinguishes it and finally returning to the operator. This will leads to safety of the fire Fighter. The robot should be movable form one place to another with quick action and the source of the fire should be extinguish by sprinkling the extinguisher. The operator will be operate it from a specific distance as a fire is extinguish the robot will advances in the fired area. Our project is to save lives which could be loss due to fire. As we are the Mechanical Engineers we are try to increase the operation speed to decrease the time of fire.

II. LITERATURE SURVEY

Miss. Kena Patell, Mrs. Bhavna K. Pancholi² present a research paper on implementation methods of fire fighting robot.

they were doing survey on various methods like Autonomous robot, Android application based robot, DTMF based robot, voice operated robot. Among which, Android based robot is superior. Autonomous robot gives delayed output and voice operated robot is affected due to noise interference and voice recognize is also quit complicated task. DTMF based robot requires DTMF transmitter and receiver and is a sound activated so it is very complex system. Whereas android controlled robot is a smart system with more accurate and error free results. Thus based on comparative analysis of different implementation systems, they found that android application based implementation method is the most efficient and preferable[1].

Mustafa Hamza Abd-Elhamed Khalid¹ and Dr. Eltahir Mohamed Hussein² was designed a firefighting robot to extinguish the fire to a private buildings and warehouses by using radio frequency, PIC 16F84A where it's designed the firefighting

system which found by using LDR sensor and used c language to programming. The performance of system has been monitored through actual experience and got good results from this experiment. Based on the problems listed previously designed a car to extinguish the fire, which has a total of features including to rely on machine in firefighting operations without human intervention rendered it reduces the risk Who may affect firefighter while working and to enter the places may make it difficult for fire engines to access the normal process of making extinguish the fire and easy process , to reduce the time spent waiting for the regular fire engines are designed for some private enterprises [2].

Miss. Dipali A. Mali, Miss Pratima S. Mane and Miss. Shraddha K. Dubal, Miss. Supriya S. Kadam, works on AVR based Fire Fighting Robot they used components to make robot are i. IR Fire sensor ii. RF Module transeiver set iii. GSM module iv. DC motor v. ATMEGA16A AVR Microcontroller Using the proposed technology, the robot can detect and extinguish fire. Robot can be act as automatic location finder and path tracer. It provides greater efficiency to detect the flame and it can extinguish fire before it become uncontrollable and threat to life [3]. This project will be complete addition of electronic circuits, hardware designing and software knowledge. Less human intervention is needed for the operation of the robot. It stops the spreading of fire effectively by the use of water sprinkler. The robot can be designed to avoid obstacles in its path by using IR obstacle detection sensor [4]. It can be reprogrammed easily to add modifications. It can extinguish or fight fire for a small amount of time until human fire brigade arrive. It can detect fire only in certain locations. It will be a safest mode of operation by which many disasters can be prevented without damage.[4].

Ayush Sabat, Govinda K." prepared a robot which include system composed of IR sensor to detect the flame from surrounding environment based on the data from sensors, because its speed and accuracy is better than gas and smoke sensor . In this project robot also detect the obstacle in its path. When obstacle is present it stop and resume its running then start ringing the buzzer. It involves predefined computation of obstacle free path, which controller guides the robot. There is a provision for sending message to fire brigade, also to the person close the room where the fire has been

occurred through GSM. It alerts the peoples in industry, lab, and mill that fire has occurred by using buzzer. This robot can avoid obstacle with a better security path to overcome problem of mobile robot intelligent obstacle avoidance system [5].

III. SYSTEM COMPONENTS

3.1. CIRCUIT (work on 5volt and 12 volt)

- Microcontroller(AT MEGA312)
- Oscillator circuit
- Reset circuit
- Power supply(12 volt)
- Regulator 7805

3.2. Capacitor circuit(work on 5 volt)

- Capacitor
- IR Receiver
- Potentiometer

3.3. Driver Circuit (work on 12volt)

- Controller
- Relay

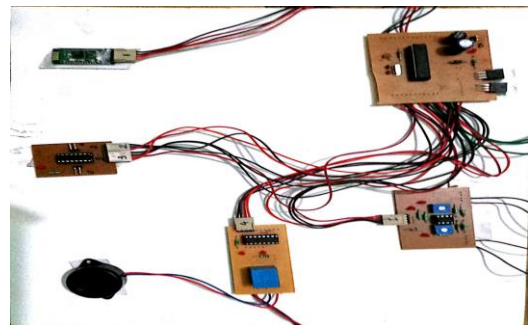


Fig. Circuit of controlling System

IV. WORKING:

The water is used as extinguisher here, the robot is control by the android application which sends signals to Bluetooth module in the circuit if the 'a' is send from the application to module then it send towards the micro controller by serial communication then microcontroller (AT MEGA 312) reads the output and it actuates the both DC geared motor in front direction and hence, the robot start to move forward direction. If we send 'b' then the microcontroller actuates motors in reverse direction.

Here 'c' and 'd' code are used to turn left and right respectively, in this case the controller actuates one motor and gives direction to the fire fighter. The IR receiver are used in comparator circuit to detect the IR

signals which are emitted from the fire and potentiometer are used to increase or decrease the sensitivity of the IR receiver if IR signals receives the fire signals then it the signals are send towards the microcontroller then microcontroller actuates the Driver circuit and the motor starts to sprinkle extinguisher and servomotor is used to give the angle to extinguisher to sprinkle it on the fire. In this way the robot is working and move to specific place and sence the fire and starts to extinguish fire .

V. APPLICATIONS

1. Can be used to show direction to the people in the fire.
2. Extinguish fire by sprinkling water.
3. Can be used in rooms where important data is saved and immediate action needed.
4. Can be used in kitchens .
5. Material handling tray can use to carry out important and valuable things .

VI. CONCLUSION

Fire is the dangerous disaster which can harm human life and nature. The technology can make robot as advance as it will find source of fire and control it without affecting life of fire fighter. The use of various types of fire fighter robot can be make which are mobile can find the area of fire and sprinkle the extinguisher on the fire to control fire and minimize the damage. The fire fighter robot can be used at a serious conditions is protects life and can be work efficiently. As the technology getting advance the robots get updated and new techniques will introduce in the robot to extinguish fire .

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