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Fire Extinguisher Robot

Miss. Rajmane Shraddha[1], Mr.Shaikh Aslam [2], Miss. Tat Anjali[3], Mr.Shaikh J.H.[4]
[1, 2, 3, 4]*SVPMs COE ETC Engineering Department, SPPU University*

Abstract: The fire difficulties to detect the small burnt area and location that is hard to be reach by the user. Besides is cost the loss suffered in the event of fire slow to act. The use of fire fighting robot can reduce the error and limitation that are faced by human fire fighters.

Keywords*: Arduino, GSM module, DC motor, Flame Sensor, Ultrasonic Sensor*

I. INTRODUCTION

Now a day's mobile robots are very useful in construction sites ware-houses and manufacturing plants. Mobile robots can also be used in material handling applications which applications are growing day by day. For analysing different items and for handling materials mobile robots can be used. Wireless navigation is also possible for movements of mobile robot, can be controlled through android. Fuzzy logic control mechanism is used to control robot. That model does not need any mathematical model controlling.
Previously Fire Fighting Robots were controlled by using different electronics devices .But this reduces the scope of control of fire fighting 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's 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 .Our project is designed to build an android application which can control operations of the fire-fighting robot.

II. LITERATURE SURVEY

A. Pooja, Renu Singh & Shubham Rai: "A Review on RF based Fire Extinguishing Robot"- In this paper the fire Extinguisher Robot is a Hardware based model used to automatically extinguish the fire during fire accidents. The Robot finds its applications in Rescue operations during fire accidents where the possibility for service men to enter the fire prone areas is very less. Robot is defined as a mechanical design that is capable of performing human tasks or behaving in a human-like manner. By attaching a small fire extinguisher to the robot, the automation put out the fire by human controlling.

B. K. Young-Duk, K. Jeon-Ho, S. Duk-Han, M. Jeon-Il, R. Young-Sun, and A. Jinung:" "Design and implementation of user friendly remote controllers for rescue robots in fire sites"-The system is made efficient by SIMs so that the SMS can be received by number of devices boards in a locality using techniques of time division multiple access. .The GSM modem receives the SMS. The AT commands are serially transferred to the modem. In return the modem transmits the stored message through the wireless link.

III.PROBLEM STATEMENT

The security of home, laboratory, office, factory and building is important to human life. We develop security system that contains a fire protection robot using sensor. The security system can detect abnormal and dangerous situation and notify us. First, we design a fire protection robot with extinguisher for the intelligent building. Besides, Human had difficulties to detect the small burnt cause by electrical appliances. The late time user takes to extinguish the fire. User may take a late time to extinguish fire like finding the water source to extinguish fire when want to extinguish the fire. The fire difficulties to detect the small burnt area and location that is hard to be reach by the user. Sometimes tough fire Extinguished for example spaces are hard to see. Besides is cost the loss suffered in the event of fire slow to act.

IV.PROPOSED SYSTEM

Our project is designed to develop for fire fighter robot. The fire extinguishing system is activated once the sensors detect the fire. The Flame sensor is used to detect the fire i.e. smoke sensor (light intensity) and another is temperature sensors. When these sensor is activated, the fire is detected. The fire extinguisher is mounted on the robotic vehicle which is then send the sms to user using GSM module. At the receiving end, two motors are interface to the controller. These, two motors are used for the movement of robot. All of the process occurs autonomously without any human intervention.

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V. BLOCK DIAGRAM

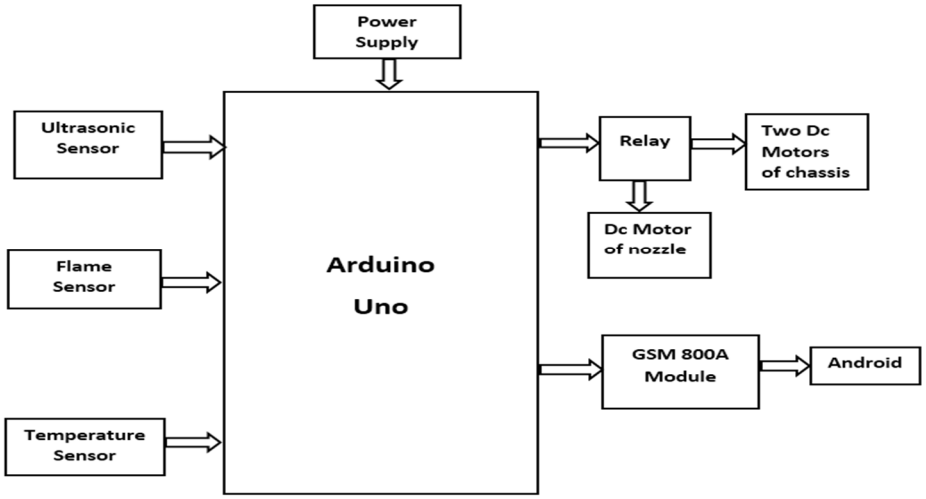
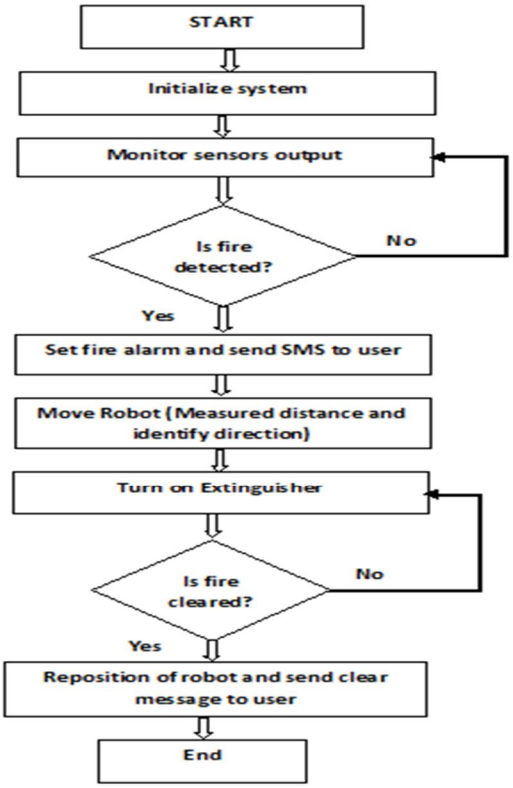


Fig: Block Diagram of Fire Extinguisher Robot

A. Block Diagram Description

Flame sensor can be used to sense the fire then robot can take the action. The temperature sensor is used to detect the temperature of burning area. These will also help to robot for fire detection. Ultrasonic Sensor can be used to avoid obstacles in the path. Ardiuno is a board having onboard Atmega 328p controller through which robot control can takes place. GSM module is used for sending an alert sms to the user. DC motors are connected to the robot chassis. The nozzle can be used to sprinkle the water using pump.

VI. FLOWCHART



VII. ADVANTAGES

A. Reduces human efforts.
B. Capability of sensing accurately with increased capability.
C. To detect the exact direction of the fire source.
D. Fast access and can reach at any place where the fire is present.

VIII. APPLICATIONS

A. Can be used in extinguishing fire where probability of explosion is high.
For e.g.
1) Hotel kitchens.
2) LPG/CNG gas stores, etc.

B. Every working environment requiring permanent operator's attention.
1) At power plant control rooms.
2) At captain bridges.
3) At flight control centres.

C. The Fire Extinguisher Robot Could be used to fight fires in hazardous location.
D. The Fire Extinguisher Robot Could be used to enter small space that are impossible to be accessed by a person.
E. It can be deliberately in industrial application commercial and domestic sector where the requirement of work demands.
F. We used webcam technology (Mobile camera to camera connection) for long distance visibility without moving anywhere.

IX. CONCLUSION

The proposed system shows how the fire extinguisher robot will automatically detect the fire areas using sensors. At the same time the robot will send an alert sms to user using GSM module and then will take action. If any obstacle is there through-out the route then the ultrasonic sensor plays a very important role that help in avoiding obstacles. The surveillance is always has been a quite sensitive task. And it includes so many risks. So it's better to use robot for this job instead of people. And if you are able to control the robots with efficiency and accuracy then you can guarantee yourself with good results and success.

X. ACKNOWLEDGMENT

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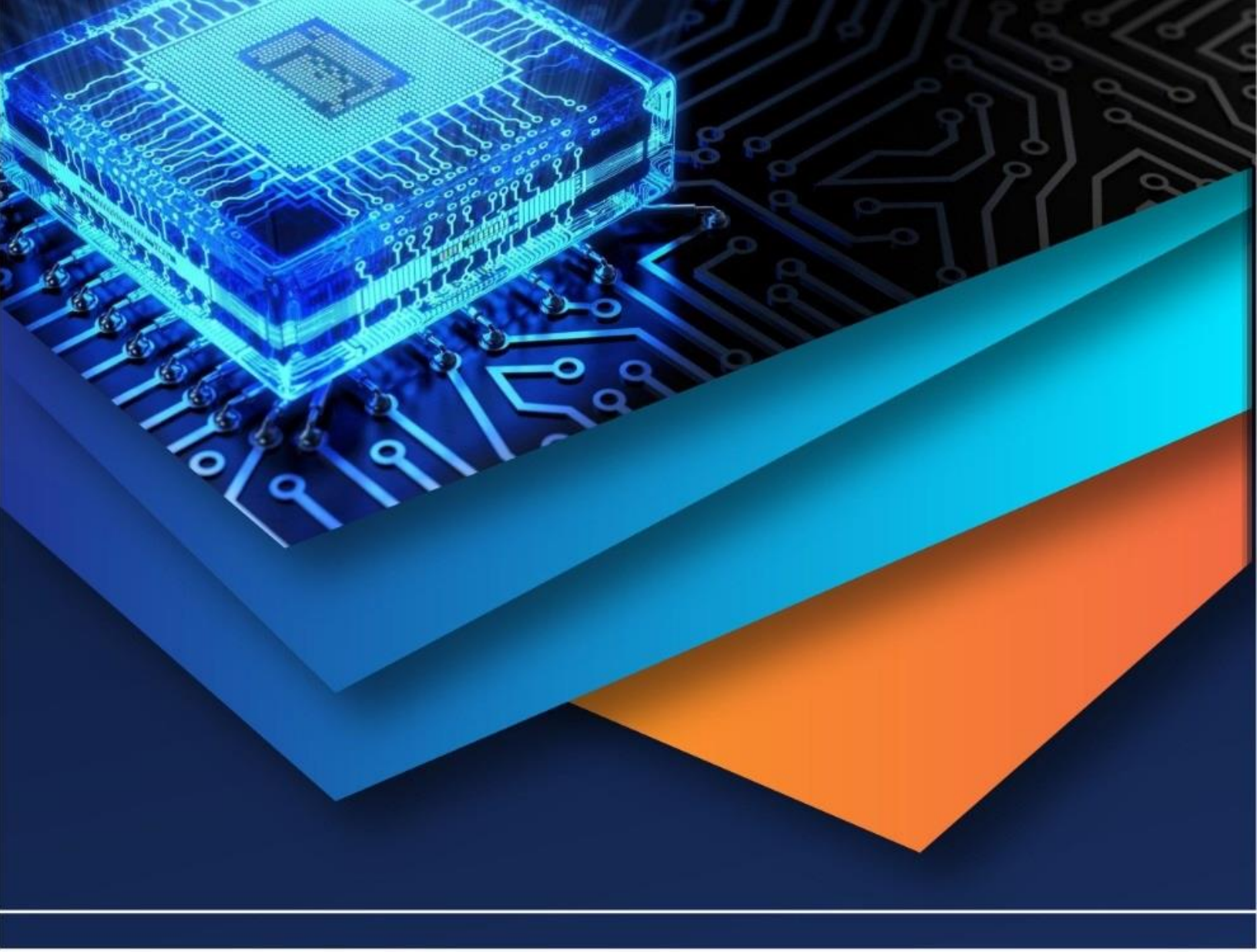

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