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IoT BASED SELF CONTROLLED ROBOT FOR GAS AND FIRE DETECTION

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I. ABSTRACT:

Accidental fires are a growing danger in today's homes, apartment buildings, and neighborhoods. Due to a lack of technological advancement, dealing with fires may be very risky for anybody involved, even fire fighters. As a result, instead of sending in people to put out the fire, the robots are employed to save the day. In our project, a firefighting robot is utilized to sound an alarm and proceed toward the source of the fire in order to douse the flames or smoke. Therefore, the goal of a firefighting robot is to save lives and put out a home fire as quickly as possible. As a result, both the victims and their possessions are safer. The gadget is equipped with a number of sensors and actuators, such as a flame sensor, ultrasonic sensor, MQ2 (LPG) sensor, and motors and a buzzer.

II. INTRODUCTION:

There have been several fire incidents that we have learned about recently. Go-downs, fuel storage facilities, home electrical shorts, etc., top the list of sites where accidents happen most often. In most instances, there was a tremendous loss of both money and life. Therefore, robotics is the superior method of safeguarding human lives, valuables, and the environment. However, there are drawbacks to using water sprays as part of a building's fire suppression system. For instance, it would ruin electronics, paper, and furniture in the affected area. Furthermore, there may be occasions when help from the appropriate local government department is delayed.This proposal suggests that a firefighting robot put out the fire right away when the sensors detect it, before a fire occurs everywhere, to prevent and/or reduce losses and costs, to ease the work for firefighters as they show up, and to preserve many firemen's lives by conquering their jobs. Our goal is to create a fire alarm system that is simple enough for anybody to install in their home. In addition to storing data in the Telegram cloud, it should be able to identify fires in the fewest possible locations, allow residents to activate it from wherever is most convenient, and provide warnings for all of the areas of the home that have been designated.

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BLOCK DIAGRAM:
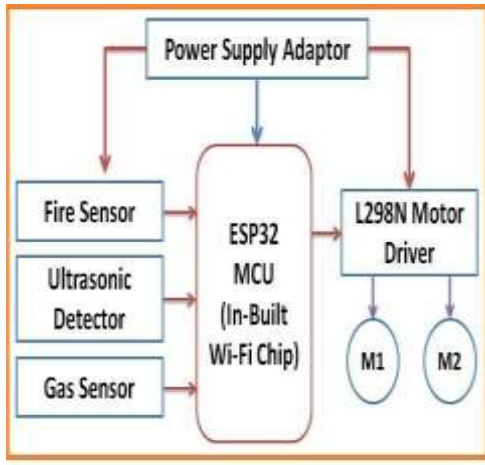
III.   LITERATURE SURVEY:

3.1.   The Design of a Novel Multi-Purpose Fire Fighting Robot with Video Streaming Capability:

In this work we are going to designer multipurpose firefighting robot which use a remote controller we control the robot from a safe distance the user can monitor the robot using FPV camera with receiver and transmitter and also this robot having a vacuum fan using that fan itcan remove the smoke As Quick As Possible with help of image processing this robot can detect human face which help the Firefighter to identify and rescue the human using face detection.

3.2. Control of an Autonomous Industrial Fire Fighting Mobile Robot:

In this project we are going to design and construct firefighting mobile robot which controlled by two isolated DC geared motor and also this robot perform analogue to digital conversion with help of Atmega 32 microcontroller the 5 Infrared sensor is connected to the robot two sensor is to control the DC geared motor and other sensors are used to detect the Fire after finding the candle fire with the

help of DC water pump the robot extinguish the Fire the result shows robot module is successfully implemented. 3

3.3 Android Controlled Firefighting Robot using Arduino:

In this project we are going to build the Android application which can helps to control the robot using a Bluetooth module and also so it use two types of sensors to detect the Fire they are fire sensor and smoke sensor and also so this robot can navigate its environment through two types of algorithm they are tracking Fuzzy Logic controller and obstacle avoiding Fuzzy Logic controller using ultrasonic sensors they avoid obstacle and using temperature sensor the robot can identify the Fire and then the tank start working .

3.4 Fire Fighting Robot:

The user designed this fire extinguish robot which uses the Microcontroller LPC 2138, LCD display also use temperature sensor Smoke sensor IR sensor Relay Pump DC IC DC motors Bluetooth module the robot having a Android phone which helps The handling of the robot safe area through the web page and can able to monitor the different parameters with help of web server.

3.5   Design and Fabrication of an Autonomous Fire Fighting Robot with Obstacle detection And Fire Detection Using Arduino:

The ultra-sonic is sensors used to focus on the obstacle detection and the IR is connected in voltage divider configuration with the analog input pins of the controller. When the fire radiation from the flames is noted using sensor which is set to 400. When the robot moves forward to fire the sensor value will change. When the robot get close sensor value increase when it reaches a marked value it start working

3.6. Smart Fire Fighting Robot:

Image will be of signal processing is the image, such as a photograph or video graph the output of the graph is convert to image processing which will be a image or a set of characteristics and its parameters related to the image. Using the Image Processing we can able to detect and identify Fire and also We are use the MATLAB software to detect and identify the Fire using two main detections method. They are Colour Detection and Motion Detection.

3.7. Texture analysis of smoke for real-time fire detection:

In this paper, a smoke video detection method using texture analysis is proposed. The images are divided into blocks. The texture features of each image block are computed with graylevel co-occurrence matrices. From the analysis of computing results, we see that the three texture features smoke do have obvious differences with none smoke images.

IV. EXISTING METHOD:

The aim of this proposal is to extinguish the fire by the firefighter robot directly after detecting it by the sensors and before the fire occur everywhere, to forestall and/or reduce losses and price, facilitate the work for the hearth department as they arrive and to save lots of firemen lives by overcome their jobs, in some critical cases they cannot afford. We'd like to style a hearth warning device that everyone members of the family can use it in their residences. It should be able to detect fires in the least number of places, residents should be able to activate it from convenient places and should warn residents of all indicated parts of houses and also store information in the Telegram cloud.

V. PROPOSED METHOD:

The Fire Fighting Robot is designed using ESP32 microcontroller. This is used to detect the flame, smoke and also gases in the emergency situations. Whenever fire/flame, smoke, gases is noticed it gives the buzzer as an alert to nearby people. It is controlled through the Arduino programming. It is an automatic Fire Fighting robot is used to rescue the victims who are struck in the fire affected house.

Flame sensor connected to the micro-controller detects the flame in its surroundings. The number of flame sensors can be used for more range of detecting the flame in all directions. The specified flame sensor detects the flame if in its direction. For now we used two flame sensors in the forward and backward direction. The water pump is connected to the pipe so that it is able to reach the area to spray easily. This Fire Fighting Robot is made of fire resistant material so that it could even enter into the fire to save the victims. Here the speed of motors can be controlled by Pulse Width Modulation technique.Thus, our project is able to reduce the injury to victims and also property damage to certain extent.

VI. CONCLUSION & FUTURE SCOPE:

Since the project is prototype development in fire accidents to rescue the operation instead of humans. This system can be developed on large space like in apartments and organizations with real time considerations. Thus the Firefighting robots could able to save the mankind, wealth andproperty. In the future they come up with the most advanced features that could help us in the very dangerous situations where human is helpless. Therefore, the firefighting robot project will also generate the interest and scope in the field of robotics.

VII. REFERENCES:

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