

Fire Fighting Robot with the Help of GSM and Gas Sensor

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ABSTRACT

The incident of fire is a non-destructive disaster for mankind, due to this disaster, human beings suffer many problems like heavy loss of life and property, damage to movable and immovable property and heavy damage to animals and valuable medicines. It is difficult to keep the foundation. It also generates many serious diseases along with it. All the countries of the world appoint special teams to fight the fire, whose main job is to control the fire and people with fire. To protect. They put their lives at risk and extinguish the fire, due to lack of accurate knowledge of the fire and leakage of poisonous gas, it is a very difficult task. Because the gas released from this is more dangerous than the fire, The environment of fire is full of hazards like forests, oil tanks, gas stores, fields and khaliyas etc. But it is very destructive when it is in an inaccessible place, where there is a very narrow place because people fighting the fire. The first priority is to protect people as well as their lives and property. For this, the use of modern technology with new methods in fighting fires is very important and beneficial.

This paper is based entirely on the fire fighting equipment. Whose object is to protect life and goods from fire. This paper explains the fire fighting robot which is based on GSM module and gas sensor.

This robot is light and injury in shape with the ability to test poisonous gas as well as temperature and smoke test sensor. The person who gives information about the nearby fire through mobile pay sms and able to extinguish it.

KEYWORDS-

GSM, Gas sensor, ultrasonic sensor, Fire sensor, Temperature sensor, Arduino (uno), module, Buzzer, Servomotor, Motor driver, Water pump, 4 wheel, Battery (12v).

I. INTRODUCTION

Today's era is the era of science. Science has given us many things to make our life happy. But on the day fire accidents happen. Many people die per day. A fire incident is a very common

phenomenon, due to a slight mistake, it becomes macabre. You can understand its macabre form such that just 27020 people lost their lives in India in 1.6 lakh events last year. Sometimes big buildings get caught on fire. Such heart breaking visuals make the mind tremble.

Fire is usually in such a place where it is extremely difficult to reach due to which the fire man has to face difficulty and along with the fire poisonous gas comes out which causes the suffocation to die. Therefore the robot is a suitable and important weapon to deal with this formidable problem. Robot is boon for human race. It is a type of machine that works exclusively on the basis of the program or instructions inserted by the computer. It is capable of easily performing many difficult tasks. The robot is made up of a mixture of mechanical, software and electronics engineering. Robot is an automatic machine. A robot is a kind of man-made device. It is self-operated and works on the instructions of the human being. It is capable of performing light and any task in the project. This project is based on the technology to extinguish the fire from the robot. This robot which is being mentioned in this paper, is a firefighter robot based on a GSM module with different types of sensors. Which are the following types - smoke sensors, gas sensors, ultrasonic sensors, and flame sensors. It detects fire and protects us from negligence of damage caused by this fire accident. Many types of sensors are its major disadvantages. This robot functions, the information given by its sensors which reaches the arcade reaches. Which is the brain of the robot. It uses flame sensor. It uses ultrasonic sensor to detect the presence of any object along its path and fire. This robot extinguishes the fire of any inaccessible and transition place. With a company fire, forest fire, oil store and gas store, the power plant is more likely to catch fire. It can easily be used when there is a fire. Once the fire is detected, the robot informs through the buzzer that the robot performs an electronics component whose job is to manipulate the spiral with water. Spraying

is done. The gsm module in it is also used to inform the person concerned about the conformation of fire by sms. This robot protects us in many ways. From the place of work to our house It is capable of us. It is like a very useful weapon for us which is endowed with continual and new technology. It is a major part of fighting fire. The life of fire fighter is full of dangers, controlled by it. And it can be operated, it means that it is easy to do fire fighting and relief work. Helping the fire extinguisher team without risking them is to help them without any risk. This robot itself is turned on so it is dependent on humans. This robot arduino, dc motor, wheel, multiple sensor, pump, and gsm module have been used. Is the center or in other words it controls and directs all of its parts. The robot detects the fire as it is around. It senses the sensor and reaches the arduino, the sensor's message is weak so using the amplifier The brightness of this signal can be increased or decreased. Now this signal is sent to the arduino. As the arduino sends the signal the boozor sounds and allows the robot to move. The driver circute and this allows the robot Takes it to the place of fire. And gsm does the job of sending sms. Now the relay apna works, which is to turn on the pump and spray water on the fire. Various types of sensors have been used in this fire fighting robot which is as follows-

gassensor,flamsensor,ultrasonicsensor,smo ke sensor. Whose work is different to. Arduino is the brain with the help of which is controlled and ordered. The sensor will send the data to the arduino after sensing the fire then the arduino will order the robot and notify the gsm person by the sms the ultrasonic sensor will help the robot to go near the fire. Then the robot will extinguish the fire with a water.

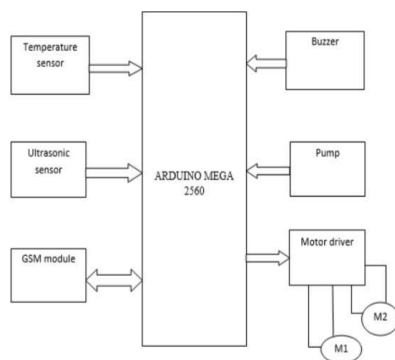


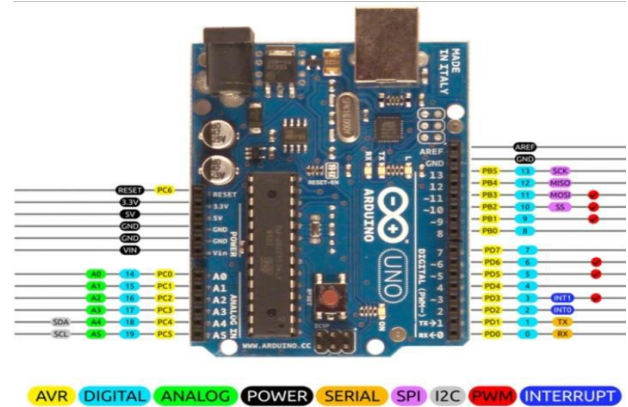
Figure 1. Block Diagram

II. PARTS DESCRIPTION

A.Arduino

Open source platform used for building electronics project,it consist of both a physical programmable

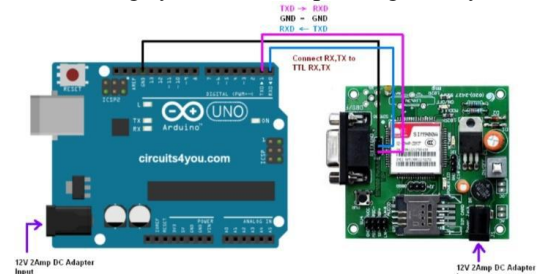
circuit board and a piece of software or IDE (integrated development environmental). that runs on your computer used to write and upload computer code to the physical board. Arduino can intrect with butoms, leds, motarsgps units.



Arduino diagram

B. GSM (global system for mobile)

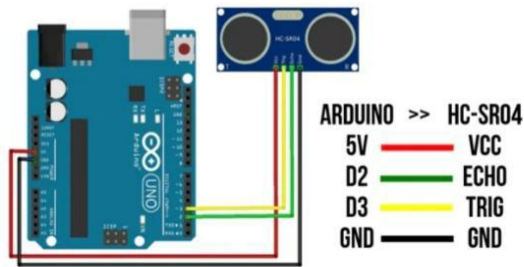
GSM is a digital cellular network system for voice and data communication.gsm is nothing big system but made of few small system which are MS(mobile system),BSS(base station sub system) NSS(network and switching system, OSS (operating sub system).



Arduino and GSM connection diagram

C.Ultrasonic sensor

Ultrasonic sensor is robotic sensor control by the arduino. It has four pin (vcc,gnd,trig and echo) and two part transmitter and receiver. 5v power is required for the operation.



Arduino and ultrasonic sensor connection diagram

D. Flam sensor

Infrared radiation sensitive sensor on yg1006 npn photo transistor yg 1006 is sensitive to infrared radiation in the wavelength range of 760 nm to 1100nm and move. 60 degree detection angle detect fire and activate buzzer.

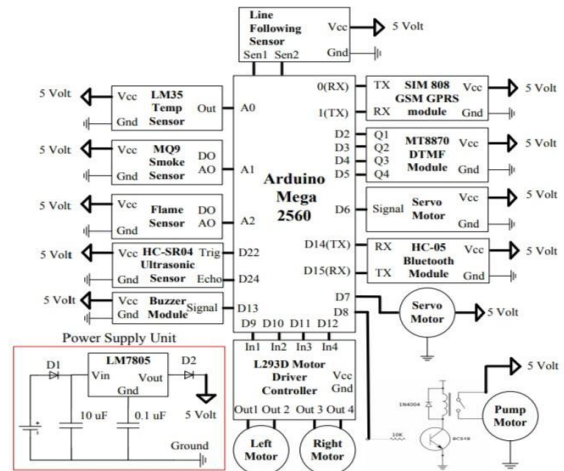
- 1.Flame sensor is kept at certain distance away from fire to avoide damage
- 2.Detect flame from distance of of 20cm.
- 3.Adjustable sensitivity
- 4.Operating voltage 3.5-5v.

E.Motor Driver

Provides interfacing between Arduino and wheel motor Quadruple high current half H drivers. Designed to provide bidirectional current up to 1A. Wide supply voltage 4.5-36v

Working

Ultrasonic sensor are those sensor which use to detect the object to maser distance itself ar object two transducar one wave are reflected by the object and observe by the receiver and echo pin go slow. And trig is input of sensor 10m/sec use to trig and object distance is calculated by simple distance and time formula,infrared radiation sensitive sensor yg 1006 npn are use to detect the fire and buzzer are ring as soon as and send data to the arduino and related program code is coded in arduino. Robot move direction which fire is occuras and reach the spot area and gsmare send a sms on the owner mobile. dc motor are use to run fan or water pump to extinguish the fire.



Circuit Diagram

Advantage

- Economically and eco friendly
- Reduce the human danger
- It can develop the auto system for the fire saftey
- It aides the human in suppressing the fire and provide the situations awareness.

Disadvantage

- It is not suitable for large fire
- System used only 3 kg

III. CONCLUSION & FUTURE SCOPE

This robot is with developed technology. It is area is very wide. This is a momentarily report of a fire incidently. It accurately predicts the occurrence of fire. The special sensor in it is its specialty it reduce man's dependence. It does its work very quickly. Man can control and order it from a for and its contributes to prevent any untoward incident from happing.This robot can help the farmers along with protecting the farm from fire, the farmer is more prone to fire as the crop is harvested, it can monitor the crop as well as maintain the normal and the farmer gets his pick. Can send on the phone, it can be made very useful by using Internet of Things, which can work their stress with the dangers of human life.

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