

FIRE FIGHTING ROBOT

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ABSTRACT

In the recent years, robotics has turned out to be an ingredient over which many people had shown their interest. Robotics has gained popularity due to the advancement of many technologies of computing. So, we proposed to design something that can make humans life easier and comfortable. Fire-fighting is an important but dangerous occupation. A fire-fighter must be able to get to a fire quickly and safely extinguish the fire, preventing further damage and reduce fatalities. Technology has finally bridged the gap between firefighting and machines allowing for a more efficient and effective method of firefighting. Robots designed to find a fire, before it rages out of control, could one day work with fire fighters greatly reducing the risk of injury to victims. With the invention of such a device, people and property can be saved at a much higher rate with relatively minimal damage caused by the fire. Our main objective was to design and build a prototype system that could automatically detect the fire.

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I. INTRODUCTION

Heat Robotics is one of the fastest growing engineering fields of today. Robots are designed to remove the human factor from labor intensive or dangerous work and also to act in inaccessible environment. The use of robots is more common today than ever before and it is no longer exclusively used by the heavy production industries. The need Fire extinguisher Robot that can detect and extinguish a fire on its own is long past due. With the invention of such a device, people and property can be saved at a much higher rate with relatively minimal damage caused by the fire. Our task as engineers was to design and build a prototype system that could autonomously detect and extinguish a fire. Also aims at minimizing air pollution. In this Project we design a wireless controlled Robot machinery and robotic design become important in helping human. This Fire Protection Robot was design to help people in any destructive burnt situation where this robot can extinguish burnt area immediately using autonomous system.

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.

Fire fighters face risky situations when extinguishing fires and rescuing victims, it is an inevitable part of being a fire fighter. In contrast, a robot can function by itself. Robots decrease the need for fire fighters to get into dangerous situations. This robot provides fire protection when there is a fire in a tunnel or in an industry by using automatic control of robot by the use of microcontroller in order to reduced loss of life and property damage if a robot is used instead, which can be controlled from a distance or which can perform actions intelligently by itself, which will reduce the risk of this task of fire fighting. Robot is a mechanical device that is used for performing tasks that includes high risk like fire fighting There are many types

of robots like fixed base robot, mobile robot, underwater robot, humanoid robot, space robot, medicines robot etc.

II. LITERATURE SURVEY

[1] "Automatic Fire Fighting Robot", Abhilash Dhumatkar, Sumit Bhiogade, Shashank Rajpal, Datta Renge, Prof. V. Kale. In this Automatic Fire extinguisher Robot that can detect and extinguish a fire on its own is assembling of various components. A Thermostat Sensor, sometimes called an optical sensor, Detects visually sense the fire, usually in a narrow range, in order feature in forest operations, at industrial check points in undeveloped villages, to momentarily distract an fire, to helpful fire covered area at much less time and useful from dangerous hazardous the environment using fire extinguisher robot. A dazzler, sometimes called an optical distracter, transmits a visually intense light, usually in a narrow beam, in order to 1) attract the attention of a person and to make them alert to heck points in non-combat land operations, to momentarily distract an assailant, to alert drivers in vehicles approaching a check point, and to alert civilian traffic to approaching forces. Developing manual control for a automatic fire fighting robot: These navigation schemes may vary from as simple and cheap as IR sensors circuits to as complex and expensive as vision circuits. The choice of which kind of navigation scheme is to be employed depends fully on the requirements of the user. From industrial point of view these Automatic Fire Fighting robots are employed as goods carrier to Stop the fire and work as the Fire extinguisher another where manpower are not possible to be reached. A simple Automatic Fire Fighting robots sense the fire using simple Thermostat sensors but when it is on out of sense range it have to make a proper range for sensing the fire.

[2] "A Survey on Fire Fighting Robot Controlled Using Android Application" Rutuja Jadkar, Rutuja Wadekar, Shweta Khatade, Sayali Dugane, Prof.Dr.S.N.Kini, fire causes tremendous damage and loss of human life and property. It is sometimes impossible for the fire fighter personnel to access the sight of fire because of explosive materials, smoke and high temperature. Through this we can conclude that robot can be placed where human lives are at risk. The robot can operate in the environment which is out of human reach in very short time. In such environments, fire fighting robots can be useful for extinguishing fire. These robots should be controlled remote operators who are located far away from the fire site using remote communication systems. The robot accurately and efficiently finds the fire within minimum time after the fire is detected. In future work Project aims to promote technology innovation to achieve a reliable and efficient outcome. Mobile robot that can move through a model structure, find fire and extinguish it. The movement of the robot is controlled by the sensors which are fixed on the mobile platform .is to provide security of home, laboratory, office, factory and building is important to human life. We develop an intelligent multisensory

based security system that contains a fire fighting system in our daily life. We design the fire detection system using sensors in the system, and program the fire detection and fighting procedure using sensor based method.

[3] "FIRE FIGHTING ROBOT"

Sahil S.Shah, Vaibhav K.Shah, Prithvish Mamtora and Mohit Hapani, This paper has presented a unique vision of the concepts which are used in this particular field. It aims to promote technology innovation to achieve a reliable and efficient outcome from the various instruments. Experimental work has been carried out carefully. The result shows that higher efficiency is indeed achieved using the embedded system. With a common digitalized platform, these latest instruments will enable increased flexibility in control, operation, and expansion; allow for embedded intelligence, essentially foster the resilience of the instruments; and eventually benefit the customers with improved services, reliability and increased convenience. The day is not far when this technology will push its way into your house hold, making you more lazy. This paper presents the major features and functions of the various concepts that could be used in this field in detail through various categories. Since this initial work cannot address everything within the proposed framework and vision, more research and development efforts are needed to fully implement the proposed framework through a joint effort of various entity

[4] "Fabrication of Fire Fighting Robot", Sunil Mathew, Gaikwad Sushanth, KR Vishnu, V. Vishnu Nair, and G. Vinoth Kumar, 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 fire extinguisher, and then return to the front of the house. 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. This mission is divided into smaller tasks, and each task is implemented in the most efficient manner such as self-autonomous start of the robot, navigation of the robot in every r distance, extinguishes it and finally returning to the front of the house.

The conclusion is to provide security of home, laboratory, office, factory and building which is important to human life. We develop an intelligent multisensory based security system that contains firefighting system in our daily life. We design the fire detection system using sensors in the system, and program the fire detection and fighting procedure using sensor based method. The system is cost effective, has a wide applications which when implement can show good and effective result. It can be use deliberately in industrial applications, commercial and in domestic sectors where the requirement of automatic work.

III. BLOCK DIAGRAM

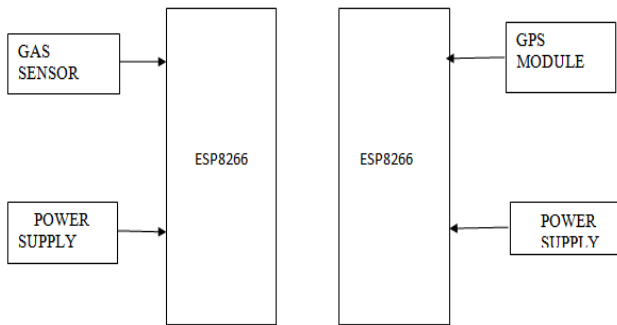


Fig1. Block diagram of transmitter

GAS SENSOR :

Sensors are used to get information about the surroundings as it works by just measuring the aspects of the environment and production an equal proportional electric signal stating that change or the state of the surroundings.

Sensors usually imitate the way we sense but some sensors even sense things that we can't like ultrasonic sound waves and magnetic yields

ESP 8266 :

The ESP8266 Wi-Fi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor This module has a powerful enough on-board processing and storage capability.

GPS MODULE:

The GPS smart antenna will track up to 32 satellite at a time while providing fast time-to first-fix, one second navigation update & low power consumption. It can provide you with superior sensitivity & performance. Its far reaching capability meets the sensitivity requirements of car navigation as well as other location based application.

In above section, there are two ESP MODULE, in which the first ESP MODULE is connected to gas sensor. Another ESP MODULE is connected to GPS MODULE. When fire is detected then fire is sensed with the help of gas sensor. After detecting the fire, the message is send through ESP which connected to gas sensor to ESP on receiver side.

Once message is received on the receiver side ESP which connected to motor driver module, by which movement of robot occur.

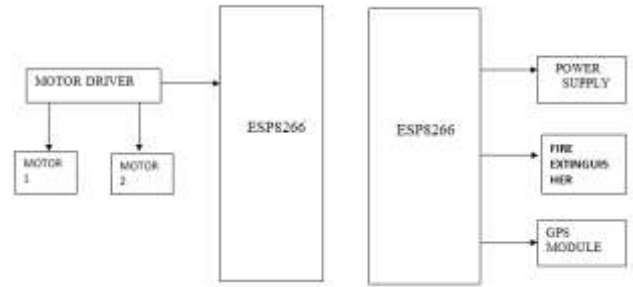


Fig 2. Block diagram of receiver

Motor Driver

Motor driver is used to control motors in autonomous robotic. Motor driver act as an interface between controller and motor in robotics. Motor drivers are primarily used in autonomous robotics only. Also the controller operate at low voltages and require a small amount of current to operate while the motors require relative higher voltages and current. Thus current cannot be supplied to the motors from the controller. This is the primary need for the motor driver.

Fire Extinguisher

Fire Extinguisher is used to extinguish the fire which occurs at site of disaster. There are multiple ways in which we use the fire extinguisher. It can available in form of Co2 cylinder, water tank, Fire extinguisher pump etc. In industries Fire extinguisher pumps are most widely used.

In this section, Motor Driver has 2 motors which has connected to ESP module. Another ESP MODULE having connection with power supply and GPS MODULE. When we get message from Tx section through ESP MODULE connected to GPS on Rx side, then Robot get initialized. Robot starts moving towards destination and extinguishes the fire with fire extinguisher.

IV. RESULT

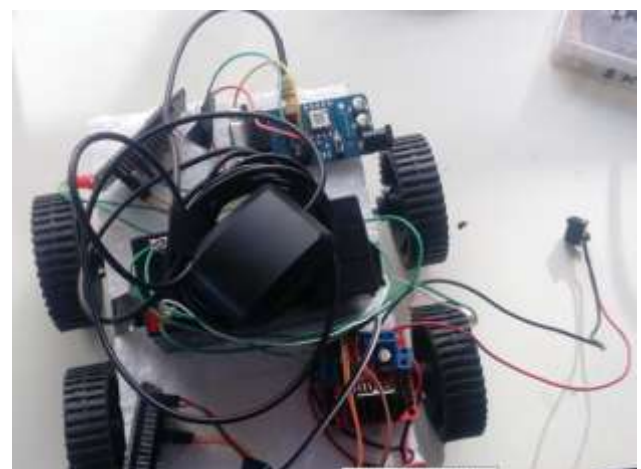


Fig 3. Robot

V. CONCLUSION

In order to make the robot performs the desired task, a programming development will be executed and to achieve the objective of the project successfully. This project will be more focused on the construction of electronic circuit which uses a ESP as controller to control the motion of robot.

Fire accidents can occur anywhere at any time and it rapidly spreads causing havoc. The robot can be used in educational institutes, malls, industries, work places or rather anywhere. Lastly, as the existing fire sensors are usually mounted on the roofs. They are also connected to the robot thus making it a furthermore fool-proof system. The conclusion is to provide security of home, laboratory, office, factory and building which is important to human life. We develop an intelligent multisensory based security system that contain fire fighting systems in daily life.

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