AUTOMATIC FIRE FIGHTING ROBOT

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Abstract: In this century, there is a big role of automation in industrial and domestic world. It is a arrangement of different elements in order to regulate, direct, sense and command itself to achieve a particular and desired result.

"Automatic Fire Fighting Robot" project has a electric thermostat technology for controlling the fire 24hrs. This project is cost effective with a explore application which will show the best result. It can be use very much in Industrial, commercial and as well as domestic purposes.

Synchronization of various equipment involve in the system i.e. Fire Sensor, Water Jet, Wireless Remote and GSM module, arduino uno, camera. Robot is capable of being remotely and automatically controlled and live video status.

I. INTRODUCTION

Robotics is one of the fastest growing engineering field of today's era. Robots are designed to remove the humans factor for dangerous work and also for difficult environment. The use of robot is more widely used than ever before. The need of fire extinguisher Robot is that can detect and extinguish the fire at its own risk. Our aim as a engineers is to design such a device which can automatically

Detect and extinguish the fire. Also aims to reduce the air pollution. This robot is design as a wireless controlled operated robot. It is a protocol which can move through a model structure, find a fire and extinguish with the help of the water Jet. Robots are very intelligent devices which can be use according to our use and our requirement. Keeping all the things in mind the robot is capable of being remotely controlled through the arduino uno. I have used very basic concept here, which are very easy to understand from the beginning to end for fresher's as well as for the masters in the engineering field and robotics. Fire can be originate when there is no one in the home or all are sleeping in the home. With the invention of such robots peoples and property can be saved at a much higher rate with minimised damaged caused of fire.

In this paper, we proposed a design and implementation of Robot. This robot can move through a model structure, and find a fire and then extinguish with the help of water jet. This meant that to simulate the real world operation of a Robot performing a fire extinguish functions in a oil field. Keep all things in mind the robot is capable of being remotely controlled and live video of fire status.

II. RELATED WORK

Automatic Fire Fighting Robot is made in such a way that can detect and extinguish a fire on its own of various types of components. A Fire sensor sense a fire in a small range in order to check in industrial check in undeveloped area. To helpful fire covered area at much less time and useful from dangerous hazardous the environment using fire fighting robot.

Developing manual and automatic control for an automatic fire fighting robot. These navigation scheme may vary from as simple and cheap as IR sensors circuit to as complex and expensive as vision circuit.

III. Block Diagram
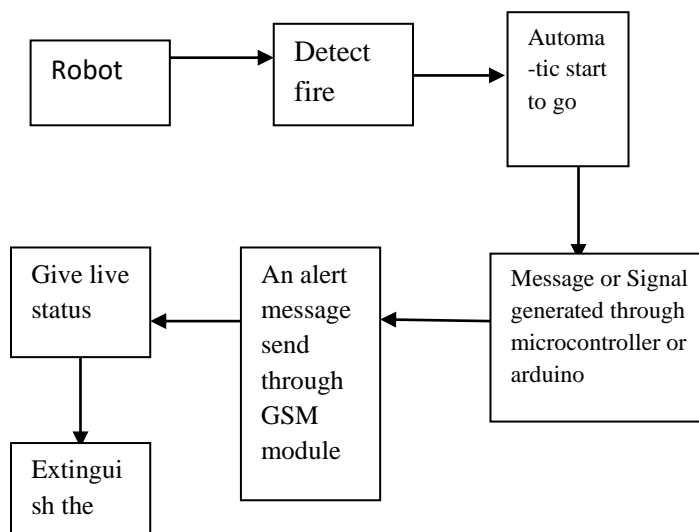
IV. Hardware Specifications

- Arduino Uno
- Arduino Nano
- Sensors
- Vehicle Body
- Water Tank
- Spray Tube
- Spray Pump
- Push Buttons
- Relay
- Transistor
- Resistors
- Diode
- DC Motors
- Bluetooth Controller
- Capacitors
- GSM module

V. Software Used

- Arduino
- Proteus
- Bluetooth Comtroller

VI. FEATURE EXTRACTION

In this methodology can be implemented by using following factors:

1. Use of Co2 Gas Cylinders.

2. Use of Dry Chemical Powder.

3. Use of sensors.

4. Automatically Operated.

5. Manually Operated

VII. Why need of Fire Fighting Robot?

1) Impact On Community:
   - To expose the community about new technology
   - To create more better and comfortable life for community
   - Encourage everyone to innovate new technology and ideas

2) Impact On Fire Department :
   - Protect fireman from risk there life
   - Provide fascility to fire station to extinguish the fire easily and without risk.

3) Suitable For:
   - Fire department
   - Factory
   - Colleges
   - Bus Station
   - Railway station
   - High explosion area
   - Chemical industrial
   - Petrol station
   - Small business stores or restaurants.

4) Innovation Our Project:

The innovation has been made in our project in which we use:

- Navigation system
- We can remotely monitoring and controlling the robot by wireless camera
- Using fire extinguisher tank
- Using this method to extinguish the fire
- Suitable to all types of fire.

VIII. Applications

The present work can be extended in several ways and some of them are given below:

- The Fire Fighting Robot can be used to fight fires in hazardous location, which firefighters cannot go easily and safely.
- The fire fighting robot can be used for domestic as well as commercial purpose.
- To save people who get trapped in the fire.
- For domestic use, we will try to implement motion planning using neural networks so that the errors can be minimized in mapping of the house.

IX. LITERATURE SURVEY

J. Reinhart V. Khandwala (2003) was et all discussed about design and the implementation of the fire-fighting robot. The key design elements of the robot to be discussed include: the assembly and construction of the robot hardware, the processing algorithm based on the sensors response, and the navigation algorithm that will enable the robot to find an efficient path in and out of the house model.

Lynette Miller   Daniel Rodriguez (2003) was all discusses the development of each component of the robot that is designed to find a small fire represented by a light emitting diode in a model home and extinguish it. This paper will talk about each component of the robot from the start signal to the robot platform to the line following and room finding and finishing with the fire detection.

Sahil S.Shah (2013) was all discussed about design   a FIRE FIGHTING ROBOT using embedded system. A robot capable of fighting a simulated household fire will be designed and built. It must be able to autonomously navigate through a modeled floor plan while actively scanning for a flame. The robot can even act as a path guider in normal case and as a fire extinguisher in emergency. Robots designed to find a fire, before it rages out of control, can one day work with fire-fighters greatly reducing the risk of injury to victims. The result shows that higher efficiency is indeed achieved using the embedded system.

U.Jyostna Sai Prasanna, M.V.D.Prasad (2013) was design the fire detection system using four flame sensors in the firefighting robot, and program the fire detection and fighting procedure using sensor based method. The firefighting robot is equipped with four thermistors/flame sensors that continuously monitor the temperature. If the temperature increases beyond the predetermined threshold value, buzzer sounds to intimate the occurrence of fire accident and a warning message will be sent to the respective personnel in the industry and to nearby fire station with the GSM module provided to it.

Swati A. Deshmukh (2015) was all discussed about the fire detection system using sensors in the system, and program the fire detection and fighting procedure using sensor based method.

Saravanan P (2015) discussed about the Design and Implementation of this project is mainly based on control of Semi - Autonomous mobile robot (SA-BOT). The system controls four DC Geared motors which is powered by the Atmega2560 and controlled autonomously by Navigation system which comprises of integrated ultrasonic and infra-red sensors. The bot is outfitted with wireless camera which captures the video and transmits it to the base station. The fire detection system comprises of LDR and temperature sensor, if there is a fire, the sensors detects it and the bot will be moved to the source and starts extinguishing it. The Extinguishing System comprises of a BLDC motor with water container. The SABOT can also be operated manually for extreme conditions. We have provided a GUI support through which the bot can controlled from the base station.

Abhilash Dhumatkar, Sumit Bhiogade (2015) was all Automatic Fire Fighting Robot" project employs the electrical thermostat technology for the controlling the fire 24 hrs. The system is cost effective, has a wide applications which when implement can show   good and effective result. Synchronization of various equipment involve in the system i.e Thermostat Sensor, water jet, wireless remote and wireless android device WiFi enabled Camera. This is mean to simulate the real world operation of Robot performing a fire extinguishing function. Fuzzy logic provided an appropriate solution to the otherwise complex task of mathematically deriving an exact model for the non-linear control system upon which conventional control techniques could then be applied.

X. MOTIVATION

The idea of making of automation in Fire Fighting Robot that has come only in this new Era. This has been made possible only in the advancement in the field of Robotics and in the technology. The research and development program in this field is still at progress. The researcher wants that there is a requirement for experimentation and research to understand of fire fighting devices and a lot of improvement can be made possible and can be changed to extinguish model that have been development.

XI. ADVANTAGES

- Through Robot high fire can be extinguish easily.
- Robot can extinguish the fire without harming humans being.
- Robot can go to harzadious places where human being can not go.

XII. OBJECTIVE

- To detect fire in the disaster prone area.
- Extinguishes fire on detection.
- Reduces the efforts of human labour and level of destruction as well as reduce the harm of humans life.

XIII. RESULT

- Less cause of accident cases. Even Working is carried out automatic mode as well as manual mode.
- Human requirement is less.
- Maintenance cost is less.
- Easily repairable.
- Improved safety.
- Protection of property from loss.
- Simple in construction.
- Easy to monitor.
- Small in size.

XIV. FUTURE SCOPE

This project has been motivated by the desire to design a system that can detect fires. In the present condition it can extinguish fire only in the way and not in all the rooms. It can be extended to a real fire extinguisher by increasing robot size and configurations. This provides us the opportunity to pass on to robots tasks that traditionally humans had to do but were inherently life threatening. Fire-fighting is an obvious candidate for such automation. Given the number of lives lost regularly in firefighting, the system we envision is crying for adoption. Of course, this project has only scratched the surface. As in the design simplifications and the implementation constraintsin suggest, our project is very much a proofof-concept. In particular, a practical autonomous fire-fighting system must include a collection of robots, communicating and cooperating in the mission; furthermore, such a system requires facilities for going through obstacles in the presence of fire, and ability to receive instructions on the fly during an operation. All such concerns were outside the scope of this project. However, there has been research on many of these pieces in different contexts.

XV. CONCLUSION

Through this we can conclude that a robot can be used in place of humans without risk of human beings life as well as life of the fire fighters. We can use this robot in our homes, labs, offices etc. This robot will provide us greater efficiency to detect the flame and it can be extinguish before it become uncontrollable and threat to life. Hence, this robot will be very helpful and can play a important role.

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