Study of Fire Fighting Robot which can be controlled by various means like Android application, Remote and Voice inputs.

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Abstract—This robot is utilized to stifle the fire if there should arise an occurrence of flame mishaps. The development of the Robot is controlled by stepper engines which are engaged with the real utilization of Robotics field. It can move in the two bearings (Forward and Reverse). Our Robot will comprise of water tank which will be utilized to shower water at whatever point it detects the fire. In this venture we will utilize the ardiuno, temperature sensor and smoke sensor which will detect the temperature alongside smoke and gives the qualities to arduino, the qualities are contrasted and limit esteems, on the off chance that the temperature is past the edge esteem, the water engine will be on which is put in water tank. Through the funnels water will be spread ablaze. This will be a self-governing robot and can be controlled through Smartphone, remote and voice input. It will give yield as per chose mode. At once it will work in just a single mode. If incidentally fire is begun then because of smoke the robot will be consequently begins its attempting to distinguish the discharge and when the robot is near the shoot then the water engine will be naturally on and water is spread ablaze. We can put the camera on robot and see the video on screen if there should arise an occurrence of flame mishap on the off chance that injured individual inside the unplanned place and requesting enable, we to can give assistance.

Index Terms—Sensor, Robot, Temperature, Smartphone, Arduino

I. INTRODUCTION

According to the report of IAFF in the year 2010, 1.9 fire fighters per 100,000 structure fires have lost their lives per year in USA.However, this rate was increasing to three per a 100,000 structure fires. The different causes of Line Of Duty Deaths (LODD) or smoke inhalation, burns, crushing injuries and connected trauma. Statistics shows that the deaths of fire fighters are constant every year. This results in need of firefighting machines to assist the fire fighters to avoid deaths by handling the dangerous situations. So if a robot is used instead, which can be controlled from a distance or which may perform actions showing intelligence by itself, which will reduce the risk of this task of fire fighting.Robot could be a robot that's used for playing tasks that has high risk like fireplace fighting.

The Internet of Things is the between systems ad-ministration of physical gadgets, vehicles (additionally alluded to as ”associated gadgets” and ”brilliant gadgets”), structures, and different things inserted with hardware, programming, Sensors, actuators, and system network which empower these items to gather and trade information. The IoT enables items to be detected or controlled remotely crosswise over existing system foundation, When IoT is expanded with sensors and actuators, and the innovation turns into an occasion of the more broad class of digital physical frameworks, which likewise includes advancements, for example, brilliant networks, virtual power plants, shrewd homes, savvy transportation and keen urban areas.

We have organized the Fire Fighting Robot to keep from fire shaky accidents. The robotized vehicle is stacked with water tank which sprinkles water on fire. An arduino is used to control needed operation. The robot must flee normally, avoiding obstacles and meanwhile find and track the flame and smother them. To achieve the best execution with a convincing utilization, we have taken a deliberate arrangement strategy, where the robot is isolated into different rational modules reliant on convenience.

Our structure comprises of four fundamental modules:

1.Remote control
2.Smartphone control
3.Voice Control
4.Autonomous

A. Literature Survey

The main inspiration that set us on the road to do this project was saving the innocent lives of the firefighters. it is a dangerous job that puts the life of a firefighter at risk. many fire accidents which firefighter had to lose their lives in the line each year throughout the world. From the different papers reviewed, certain patterns started to appear that helped understand different sections of the robot. In 2013 a computer Vision based approach for Detection of Fire and Direction Control was introduced which played a huge hand in operating a robot over a computer. Computer vision is used to detect the presence of fire initially which is followed by necessary pixel mapping for the robot's direction control.

This was the first step towards autonomous fire fighting robot. We decided to use a modular design concept to implement fire detection. It proposes the use of computer vision based algorithm which uses color segmentation in fire detection. Correlation is used to extract non-static property of fire. robot. It has two modes auto and manual mode. The use of Arduino Uno Microcontroller is proposed in this project. The robot can be controlled with the help of a camera in manual mode as it has a live feed. You can also monitor with the help of the camera in automatic mode. With this feature, our robot can be used in dual mode. A* Algorithm is one of the Best First Search Algorithm, that combines Uniform Cost Search and Greedy Best-First Search Algorithm. There are two main complexity that we use in this robot those are time and space complexity. As time is needed for an algorithm to process the command and space for the memory usage that is going to take place.

From different papers, we have gathered different modules and have put together our own twist in it. A robot which is fully capable of autonomous operation. This concept helps to get interest further as innovation in field of artificial intelligence whereas operating towards a sensible and procurable answer to save lots of lives and mitigate the chance of property damage.

B. Concept

The Fire Fighting Robot to keep from flame hazardous mishaps. these sorts of robots can be utilized in industry parts where odds of flame blasts are high. for instance: At spot of petroleum pump, accidentally fire is begun then to avert human lives we are utilizing this sort of robots. It might conceivable that people go to quench flame and flame will get the tank of oil and the huge scale blast will happen that can prompts high scale misfortune in both human life just as money related, so to keep this kind of mishaps we can utilize this robot, Which can manages fire. The robot can be self-ruling or it tends to be controllable through the controlling framework like remotes, remote innovations or whatever else.

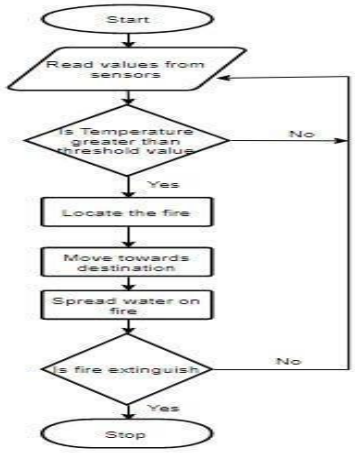

Fig.Flowchart

This kind of robots can be utilized in industry segments where groups of machines are working. In industry flame may cause due numerous reasons like high temperature, for the most part starting of electric wires that can burst into flames in this way, at this kind of spots it makes perils quench fire physically or by human activities in such a case that fire is gazed because of power starting and on the off chance that we toss the water on it, at that point it spreads again and if we come in the contact of that water then it stuns us so at such places we can utilize the robots. it is likewise helpful at spot of abnormal state temperature fire mishap where temperature is excessively high in such cases to manages fire we can utilize the robots. the robots can be self-ruling or can be controllable by controlling framework

II. CONCLUSION

Flame causes enormous harm and loss of human life and property. It is in some cases unthinkable for the fireman faculty to get to seeing flame due to dangerous materials, smoke and high temperature. Through this we can reason that robot can be put where human lives are in danger. The robot can work in the earth which is out of human reach in brief time. In such situations, putting out fires robots can be valuable for stifling flame. These robots ought to be controlled remote administrators who are situated far from the flame site utilizing remote correspondence frameworks. The robot precisely and proficiently finds the flame inside least time after the flame is recognized. In future work Project plans to elevate innovation development to accomplish a solid and effective result. Portable robot that can travel through a model structure, discover fire and smother it. The development of the robot is constrained by the sensors which are fixed on the versatile stage .is to give security of home, research facility, office, production line and building is essential to human life. We build up a canny multi tactile based security framework that contains a putting out fires framework in our day by day life. We plan the flame recognition framework utilizing sensors in the framework, and program the

fire discovery and battling technique utilizing sensor based strategy.

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