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VISION BASED FIRE FIGHTING ROBOT USING IOT

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ABSTRACT: - With the advancement in the field of mechanical technology, human interaction has become less And robots are being utilized for various works and for welfare of beings. Nowadays, fire mischances keep happening frequently, cause danger to human life & property, also cause difficulties to fire fighters to save lives. In such case, a fire-fighting robot is utilized to protect human lives, wealth & surroundings from the fire mis-happenings. This model is IOT based fire-fighting robot that detects the fire with vision technology. Afterbeing informed authorities can start visualizing the fire location and can communicate with people stuck with helpof an automatic receiver installed instructions can be given by human to the robot regarding its movement, turningon its water pump or flame sensor pump depending on fire type through long distances. The fire type is knownusing the sensors installed. The analysis also useful to further give information to safety authorities regarding amount of poisonous gases inhaled over a time period by the occupants of the affected area so they can takeappropriate actions to undo the harm.

KEY WORDS: - IoT, Human Being, Fire-Fighting Robot, Fire Mis-Happenings.

1. INTRODUCTION

Autonomous Fire Fighter Robot is the robot which autonomously detects and extinguishes the fire, it uses the flame sensor for detection, and the fire extinguisher is used to extinguish the detected fire. The robot can rotate while actively scanning for the fire, this scanning is performed by the sensors placed on the sides, when the fire is detected, the robot can move in the direction of the fire and it stops in front of it and trigger the extinguisher to turn out the fire. The aim of this project is to design a robot which acts as an extinguisher of fire. This proposed fire-fighting robot is expected to produce asmall but very powerful and versatile robot. It detects fire in the disaster-prone area. We will implement this by using FPGA board. Here, the fire detection robot overcomes the problem of hitting theobstacle by sensing the obstacle and moves into the direction where it is obstacle free. The fire-fighting robots can save a lot of lives some-day, The lives of those affected by the fire disaster as well as lives of those people working as the firefighters, It can be useful in certain types of incidents where theenvironment will be very dangerous for the humans such as the hazardous materials, the radioactivity or the propane tank which can explode. The robots assisting firefighters are not an often-seen sight, thereare robotic devices which can already be used for such purposes, these include the bots that can be thrown into the fire site to inspect the situation, as well as the large remote controlled fire extinguishers.The robot is used to fight the fire where the humans cannot enter, It can identify the fire location and itcan move automatically, It can turn itself automatically if there are any obstacles, It can take many pictures of the fire place regularly and it sends it to the central system, once the robot detects the firelocation etc.

2. EXISTING METHOD

In existed system many fire fighters are struggling toperform their duty which causes much death while on a mission and the circumstances related to each incident. Fire-fighters are our heroes and our senseof security in times of trouble. They put themselves on dangerous situations to protect us.

3. PROPOSED PROJECT

We proposed a smart fire-fighting robot which is a vision-based fire-fighting robot with IOT technology. It is designed to extinguish fire without entering into the incident area and it can able to

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detect the source of fire with the help of flame sensor. It also makes use of liquid-tank and spray mechanism for extinguishing the fire.

Fig. 1: Fixed Camera

Fig. 2: Block Diagram of Vision Based Fire Fighting Robot using IoT.

4. BLOCK DIAGRAM DESCRIPTION

Block diagram consists of Node MCU ESP32S, Motor driver L298n, Geared Motor, Power Supply, IR Sensor, IP Camera. Blynk App is used to control the movement of the robot and even the output parameters are displayed using the Blynk App Platform. IR Sensor will detect the obstaclesin the surroundings and generated output can be seen as message in Blynk app. Motor Driver is used to run the geared motor to move the rover in any direction. IP camera is used for continuous surveillance and can be recorded in the mobile or system using internet.

5. HISTORY

The first centralized IP camera, the Axis Neteye 200,was released in 1996 by Axis communication and was developed by the team of Martin Gren and Carl- Axel Alm. Though promoted based on its direct accessibility from anywhere with an internet connection, the camera couldn't stream real-time motion video, it was limited to a snapshot image each time the camera was accessed. At the time of launch, it was accessed. At the time of launch, it was considered incapable of operating as a motion camera due to what was at the time, "enormous"bandwidth requirements. Thus it was aimed primarily at the tourism industry. The Axis Neteye 200 was notintended to replace traditional analogue CCTV systems, given that its capability was limited to just one frame per second in CIF, Orone every 17 seconds in 4CIF resolution, with a maximum resolution quality of 0.1MP (352x288). Axis used a custom proprietary web server named OSYS, yet by the summer of 1998, it had started porting the camerasoftware to Linux. Axis also released documentation for its low-level application program interface (API) called VAPIX, which builds on the open standards ofHTTP and real time streaming

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protocol (RTSP). Thisopen architecture was intended to encourage third party software manufacturers to develop compatible management and recording software's.
The first decentralized IP camera was released in1999 by Mobotix. The camera's Linux system contained video, alarm, and recording management functions. In 2005, the first IP camera with on-board video content analytics (VCA) was released by Intellio. This camera was able to detect a number of different events, such as if an object was stolen, a human crossed a line, a human entered a predefined zone, or if a car moved in the wrong direction.

6. WORKING

IP cameras consist of a lens, sensor, video amplifier, microcomputer and network interface that connects the camera to the network. The sensor of the camera defines the resolution. A good lens is also required to make sure the picture is clear. Some inexpensive cameras have mega-pixel sensors, but the lens is so bad that the picture looks fuzzy. The electronics alsohelps provide a clear video signal. It assures that youcan see not only in bright sunlight but also when it gets dark. Some camera can see things at night that our eyes can't see. The IP camera systems also include the recording system. There are a number of different recording systems including special video management software (VMS), network videorecorders (NVR), and cloud recording systems. See below for more about recording the video from your IP camera system.

7. RESULTS AND OUTPUTS

The required set up shows a rover which consists Node MCU ESP32S, IR Sensor, Power Supply, Motor Driver, Geared motor. And to control the movement of the rover Blynk App Server is used. The output parameters obtained by sensors can be read in Blynk app.
The movement of the rover is controlled by using Blynk app. When any person enters the camera region then a message will be generated and it is observed in the app. To obtain this process the Node MCU should be connected to the wi-fi or internet. The live streaming of Camera is observed using Ip web cam app.
So this normal mode, the camera will be working in broad day light or somewhere where there is some source of light. This is a color mode where we can differentiate the colors while monitoring or when a snapshot was taken. Colors can be differentiated when the video has been recorded.

8. CONCLUSION

It is designed by using a temperature sensor. Fire- fighting is the act of extinguishing fires i.e., it sprinkles water on to the fire. Monitors the areas where natural calamities and bomb explosion occurs. Robot detects temperature, at the site where the robotexists. This robot is helpful in those areas where natural calamities and bomb explosions will occur. Iffire is detected with the help of sensors or manually operates the water pump mechanism through relay circuit. The proposed method is verified to be great beneficial for the security purpose and industrial purpose. Through this we can conclude that a robot can be used in place of humans reducing the risk of life of Fire fighters. We can use them in our Homes, Labs, Offices etc. They provide us greater efficiency to detect the flame and it can be extinguish before it can become uncomfortable and threat to life. Hence, this robot can play a crucial role.

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