IOT Based Fire Fighting Robot

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Abstract-Fire incident is a disaster that can potentially cause the loss of life, property damage and permanent disability to the affected victim. They can also suffer from prolonged psychological and trauma. Fire fighters are primarily tasked to handle fire incidents, but they are often exposed to higher risks when extinguishing fire, especially in hazardous environments such as in nuclear power plant, petroleum refineries and gas tanks. They are also faced with other difficulties, particularly if fire occurs in narrow and restricted places, as it is necessary to explore the ruins of buildings and obstacles to extinguish the fire and save the victim. With high barriers and risks in fire extinguishment operations, technological innovations can be utilized to assist fire fighting. Therefore, this paper presents the development of a fire fighting robot dubbed that can extinguish fire without the need for fire fighters to be exposed to unnecessary danger.

I. INTRODUCTION

Firefighter robots are primarily designed to lower mankind's carbon footprint and save human lives. There were three difficulties found. The first is the high danger lives of firefighters, who are exposed to death due to their everyday routine employment. The second issue is the time factor, which refers to how long a manual firefighting system takes to operate and how slow the situation occurs. The final issue is that the temperature of the fire has beyond the limit of the human senses. This article discusses the relevant aims for the problem described above. The first purpose is to use robots as one of the alternative paths for reducing firefighter dangerous life and improving firefighter abilities. The second goal is to warn that by developing firefighting robots, the time required to place the robot in a high-risk fire zone may be reduced. The final goal is to determine whether the robot is capable of performing its tasks in a hazardous zone with high temperatures.

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An IoT-based firefighting robot uses sensors to detect fire and smoke, and then autonomously navigates to the fire to extinguish it. The robot can be controlled remotely using a Remote Desktop application, which is connected to the robot via the internet. The application can help the robot identify the type of fire and apply the appropriate extinguishing method.

The robot's main function is to be an unmanned support vehicle that can search for and extinguish fires. It can also monitor affected areas, and help authorities visualize the fire's location and communicate with people trapped in the fire.

The robot's design typically includes an array of sensors, a central Node MCU, and two motors:

Sensors: Detect fire and smoke

Node MCU: Notifies the central Node MCU when a node detects fire

Motors: Two motors are interfaced to the L293D Motor driver

The robot can be powered by batteries or a diesel engine, and its suppression system may include water-based fire

monitors, foam nozzles, nozzles on articulating arms, and a water fog system.

IoT-based firefighting robots are intended to reduce the hazards that human firefighters face, improve situational awareness, and maximize resource usage during emergencies.

II. OBJECTIVE

This model is an IOT based firefighting robot that detects fire. After being informed the authorities can start visualizing the fire location and can communicate with people stuck with the help of an automatic receiver installed. The main function of this robot is to become an unmanned support vehicle, developed to search and extinguish fire. There are several existing types of vehicles for firefighting at home and extinguishing forest fires. Our proposed robot is designed to be able to work on its own or be controlled remotely.

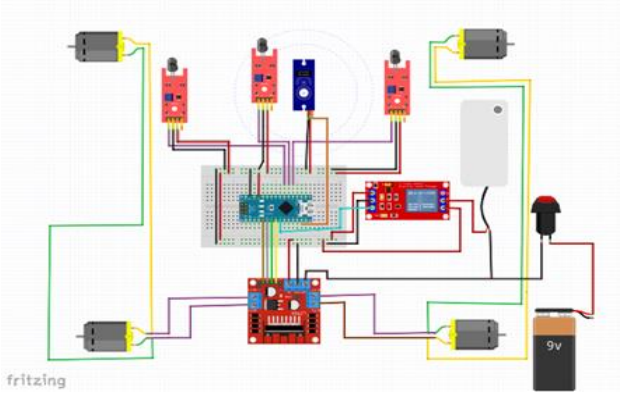
III. METHODOLOGY

Working:

The theme of this paper is to automatically sense the environmental fire and extinguish it without human intervention. The methodology is divided into three parts. The first part is on the design structure, followed by hardware description and the finally on the programming design. All these three parts were assembled together, and experiments were then performed to build a system that can extinguish the fire that was carried out

In this section, the prototype of robotic system is presented, in which it consists of IR flame sensors, servo motors, submersible water pump, motor driver, mini breadboard, BO motors, rubber wheels, processor, and communication module for exchanging data between the fire-fighting robot and Arduino software. Fig 2 shows the basic prototype of our firefighting robot. The robot carries four main functions: First, it initializes itself i.e. its sensors get initialized as the power is supplied. Second, the robots sense the surrounding environment (for instance for the level of temperature) and identify the fireplace. Third, robots send the navigating information and start to navigate itself towards the fireplace. Fourth, finally the robot starts to extinguish the fire with the help of servo motors and submersible water

B. CIRCUIT DIAGRAM



Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to asa microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program.

C.RESULT AND MODEL

D. CONCLUSION

In conclusion, this system offers a real opportunity for fire surveillance and control.

- It has low operating power requirements.
- It has quick response time.
- It is not very expensive.

E. REFERANCES.

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