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AUTOMATIC FIRE EXTINGUISHER

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Abstract — Fire can be a common problem for life and property. The automatic chimney shutoff strategy provides real-time monitoring, hood and programmed chimney alarms. It provides a kind of chimney protection system with a sturdy and safe construction, and sometimes it's worth it. Provides immediate warning in case of fire and reduces damage caused by fire. The method consists of a smoke sensor and a temperature sensor, and the working rectangle is connected to the controller. This system considers the harmful properties of smoke and in many cases avoids the possibility of false alarms.
Keywords — Fire extinguisher, Detectors, Controller, Fault tolerance, ESP8266, Sensitivity.

I. INTRODUCTION

Fire hazards can be a common problem for life and property. Automatic Chimney Shutdown Strategy provides real-time monitoring, accessories and programmed chimney alarms. This article will give you an idea of what an affordable, durable and reliable structural fire protection system looks like. Send early fire warnings and help reduce fire damage. This method consists of a smoke detector and a temperature detector connected to a controller. The system takes smoke hazards into account and often avoids the possibility of false alarms.

II. LITERATURE SURVEY

J Jalani , D Misman , AS Sadun & LC Hong (2019) "Automatic fire extinguishing robot with notification" states that automatic fire extinguishing robot with notification can detect and extinguish fires. You can also move randomly in rooms with obstacle avoidance.

Md Turab Hossain, Hadiul Islam (2022) in their paper "GSM Based fire alarm system module" stated. The purpose of this project is to assist building owners in overcoming the issue of fire spreading when the owner is not present in the structure. Resident spaces and the building are constantly prone to unexpected or critical situations that go unnoticed by those within.

B. Swetha Sampath (2020) in their paper "Hardware based Automatic Fire Extinguisher Robot" stated The system uses the IC741 as an amplifier and comparator, along with a thermocouple and water pump to automatically supply water when the robot is on fire. The robot's movements are predicted using obstacle avoidance.

III. METHODOLOGY/EXPERIMENTAL

A. Materials

Tools and technology:

- [1] Arduino IDE
- [2] Embedded C
- [3] ESP8266

Hardware requirements:

- [1] Arduino Uno
- [2] Battery
- [3] Relay module
- [4] Mini water pump
- [5] Pipe
- [6] Jumper wires
- [7] Flame sensor module
- [8] Temperature Sensor
- [9] Buzzer

B. Design/Method

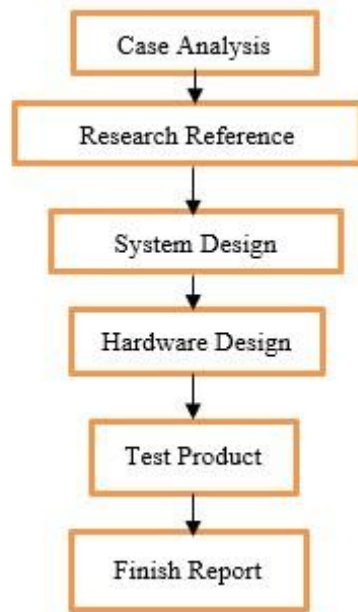


Fig. 1: Flow diagram of Working Process

C. Theory

Firstly, we gathered all the components required for the project. So, the main components used for the project were a Smoke sensor, Arduino Uno kit, ESP8266, Dc motor water pump, Relay Module, Servo motor, Buzzer, and 9v battery.

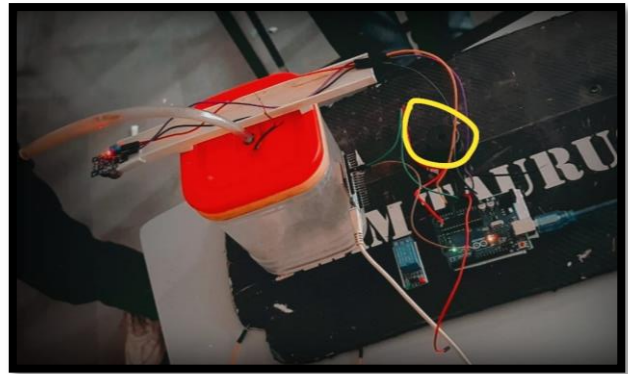
The number of smoke sensors used in the project is two. The smoke sensor can work on both analog as well as digital but we will prefer analog because as the smoke density increases the output will vary and it will be easy for us to know the changes. These two sensors are placed exactly opposite (almost 180 degrees) to each other to cover most of the area. The distance among them is about 1 ft between this sensor, Servo motor is placed exactly at the center. With the help of a servo motor, the water pipe will be set according to the sensor. The Servo motor will change direction according to where the smoke will be detected. This could be done by executing the code on Arduino IDE. Henceforth DC water pump will be connected to the servo motor which will fire the water at the prone area.

Whenever any of these two sensors detect smoke (above a particular limit which will be set by us through INTEGRATED DEVELOPMENT ENVIRONMENT), the whole system starts working. After this, the relay (used as a switch) which is connected to the Arduino Kit starts working after the detection of the smoke. The relay is integrated with the buzzer as well as the DC water pump. So, after the detection of smoke, the buzzer will create a popping sound and simultaneously water will be ejected from the DC water pump. Also, simultaneously a message will pop up on our mobile phone through ESP8266. ESP8266 is a low cost open source IoT platform.

As this will not only extinguish the fire but will also create a sound to make us or nearby people alert while a message will also get generated. Hence, we can say that the above project can be referred to as 3 LEVELED PROTECTED SYSTEM.

IV. RESULTS AND DISCUSSIONS

Developed an automatic fire extinguishing system for various containers. The basic purpose of automatic fire alarm systems is to detect fires at an early stage, notify building occupants that a fire emergency is occurring, and report the emergency to first responders.



FUTURE SCOPE

The future scope of the work is to implement equivalent procedure to any or all categories of fireplaces that ensures the whole answer for accidental fire issues. Many wealth's and lives could be saved with the help of this fire extinguisher. It will have a great advantage in industrial areas where human interference is not possible and the places are fire prone. The alarm attached to it would immediately allow the user to know that fire has occurred so it will avoid a large damage to occur. This extinguisher could also be used in the scientific laboratories for the protection against fire. The SMS system would let the owner of a firm know about the damages caused by the workers.

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