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Belagavi

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New Delhi

**DEPARTMENT OF COMPUTER SCIENCE AND
ENGINEERING**

INTERNET OF THINGS

REPORT

Submitted by

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**Computer Science and Engineering –
Cybersecurity 2024-2025**

DECLARATION

We, **Varshith Y, Kapsha Suraj Singh and Sagari Aravind**, students of fourth semester **BE in Computer Science and Engineering – Cyber Security, Department of Computer Science and Engineering**, RV College of Engineering®, Bengaluru, declare that the Computer Networks Experiential Learning with title “**AUTOMATIC FIRE EXTINGUISHER AND ALERTING MECHANISM**”, has been carried out by us. It has been submitted in partial fulfillment for the award of degree in **BE in Computer Science and Engineering-Cyber Security** of RV College of Engineering®, Bengaluru, affiliated to Visvesvaraya Technological University, Belagavi, during the academic year **2024-25**. The matter embodied in this report has not been submitted to any other university or institution for the award of any other degree or diploma.

Date of Submission:

Signature of the Student

Student Name: Kapsha Suraj Singh, Varshith Y, Sagari Aravind

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ABSTRACT

Fire incidents in residential and commercial areas pose significant threats to both life and property. Traditional fire detection and extinguishing systems often rely on manual intervention, leading to delayed responses and increased damage. The proposed "Automatic Fire Extinguisher and Alerting Mechanism" addresses this challenge by integrating sensors, microcontrollers, and automatic extinguishing systems to detect and respond to fires in real-time.

This system is designed to activate a water pump and sound alarms upon detecting fire or smoke, providing a rapid response that minimizes damage. Additionally, a mobile application integrated with Firebase sends real-time alerts to users, ensuring they are informed of any fire incidents, even when away from the premises. The system's scalability allows for wide adoption in both residential and commercial settings, offering a reliable, efficient, and user-friendly solution for enhanced fire safety. This project outlines the hardware components, system architecture, and real-life applications of this innovative fire safety mechanism.

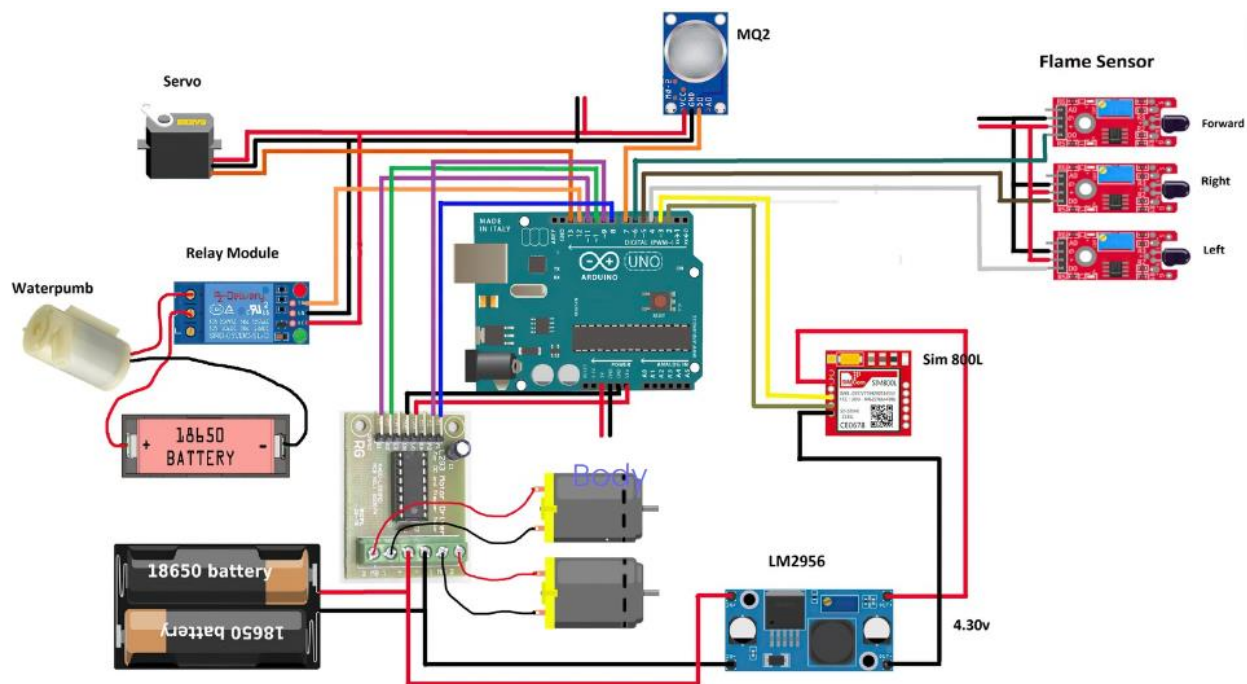
Chapter 1: Introduction

1.1 Introduction to Fire Safety

Fire safety is essential for safeguarding lives and property. As residential areas continue to develop, fire hazards pose a significant risk, requiring efficient preventive measures. Early detection and prompt action are critical in minimizing the impact of fire incidents. Traditional fire detection systems often require human intervention, which can delay the response time, leading to increased damage.

1.2 Fire Extinguishing

Fire extinguishing systems are designed to control or eliminate fire threats. While many existing systems rely on manual operation, modern technology enables automatic mechanisms that detect and extinguish fires without human involvement. These systems integrate sensors, microcontrollers, and actuators to provide immediate responses, enhancing overall safety.



Chapter 2: Hardware Specifications

2.1 LN298 Motor Driver

The LN298 motor driver plays a crucial role in controlling the water pump system. It allows the microcontroller to manage the motor, activating the pump when the sensors detect a fire. The motor driver ensures efficient operation, making the system responsive and reliable.

2.2 Water Pump

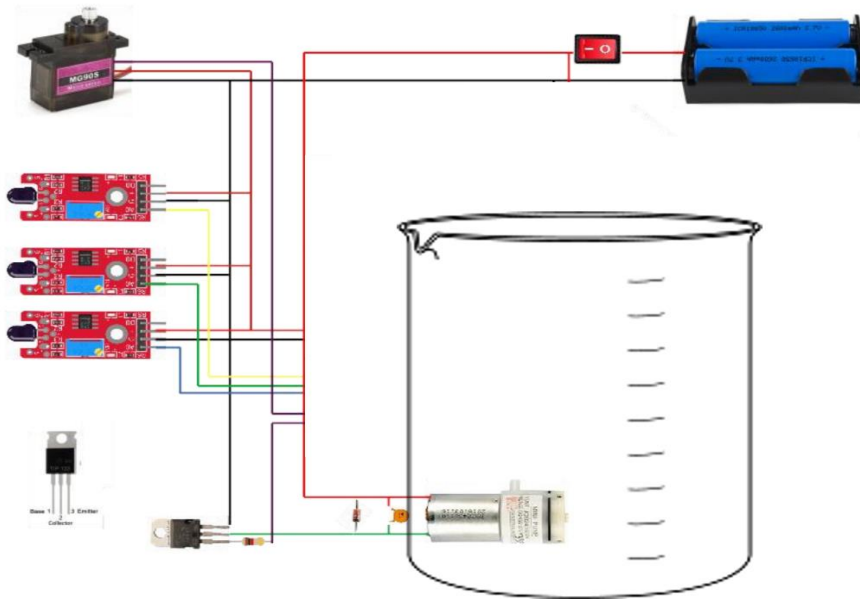
The water pump is responsible for delivering the extinguishing agent (usually water) to the fire-affected area. Connected to the microcontroller through the LN298 motor driver, the pump activates automatically when fire or smoke is detected, extinguishing the fire promptly.

2.3 Fire Sensors

Smoke and flame sensors are installed in key areas to detect the presence of fire. These sensors provide real-time data to the microcontroller, allowing for immediate response. They are essential components of the automatic system, ensuring that fires are detected at the earliest possible stage.

2.4 Buzzers

Buzzers act as auditory alarms, alerting occupants when a fire is detected. This provides an additional layer of safety, ensuring that people are informed of potential danger even if they are not monitoring the mobile app.



Chapter 3: Real-Life Applications

3.1 Application 1: Residential Fire Safety

The automatic fire extinguisher and alerting mechanism can be applied in residential homes to safeguard against fire hazards. By installing sensors in kitchens, living rooms, and bedrooms, homeowners can ensure early detection and prompt extinguishing of fires, minimizing damage and enhancing safety.

3.2 Application 2: Commercial Buildings

In commercial settings, such as offices and retail stores, this system can provide a scalable solution for fire safety. Multiple sensors and pumps can be integrated across different areas, ensuring comprehensive coverage. The real-time alerting system enables building managers to take immediate action, even when offsite.

Conclusion

The Automatic Fire Extinguisher and Alerting Mechanism represents a

significant advancement in fire safety technology. By combining sensors, microcontrollers, and real-time alert systems, it provides an efficient, reliable, and automatic response to fire incidents. This system not only enhances safety but also reduces potential property damage by ensuring prompt action without relying on human intervention. With its wide range of applications in both residential and commercial environments, the system offers a scalable and user-friendly solution to fire hazards.