Bangladesh Army University of Engineering and Technology(BAUET)
Department of Information and Communication Engineering (ICE)

PRESENTATION ON

A Fire Detection System in an Automated Home Management System

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Course Title: Internet of Thing (IoT) Sessional

Table of Contents

Introduction

- IoT, a network of interconnected devices that can communicate and exchange data over the internet.
- Home Automation System integrating fire detection, demands for smart home solutions
- Enabling remote control of appliances via a smartphone or web application and incorporating fire sensors for timely hazard alerts.

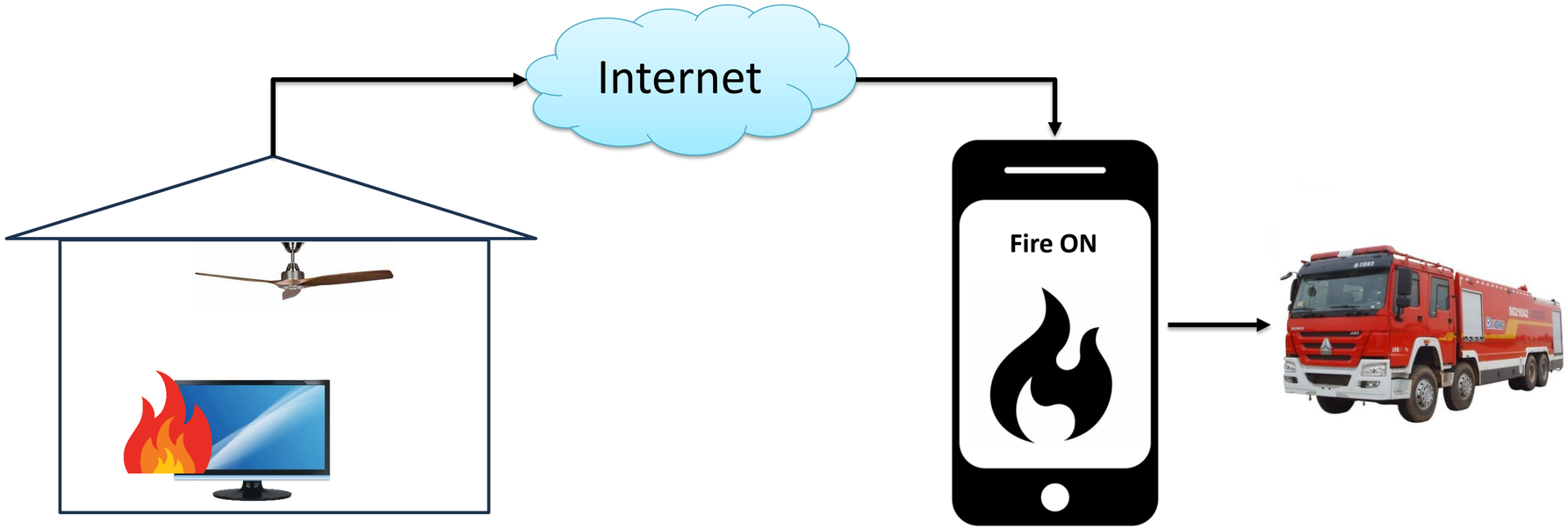


Figure 1: Home Automation System integrating fire detection

Literature Review

Author	Title	Description
[1] Waheb A. Jabbar et al.	IoT-Based Automation System for Smart Home	Analyzes a low-cost Wi-Fi based automation system, uses Android-based application for monitoring temperature, humidity, and motion
[2]Faisal Saeed et al.	IoT-Based Intelligent Modelling of the Smart Home Environment for Fire Prevention and Safety	Discusses fire detection systems using WSN and GSM.
[3] Howedi et al.	Low-cost Smart Home System	Utilizes Arduino Uno, PIR sensors, DHT11 temperature sensors, and INA219 for operating doors and windows.
[4] N. Adnan et al.	An IoT Based Smart Lighting System Based on Human Activity	This paper Aims to optimize home lighting for comfort and eye health. Utilizes a dimmer circuit, Arduino with Bluetooth, light sensors, and an Android app. Measures ambient light to adjust artificial lighting. App allows users to set nine activities. Prototype successfully tested
[5] D. Pavithra et al.	IoT based monitoring and control system for home automation	Efficient IoT system monitors & controls home appliances via web, utilizing portable devices as interfaces, Zigbee/Wi-Fi for communication. Enables remote control of lights, fans, door locks via Smartphone & Raspberry Pi server. Includes smoke detection for safety, relay hardware for scalability.
[6] R. Desai et al.	IoT-Based Home Automation with Smart Fan and AC Using NodeMCU	The paper integrates NodeMCU with an Android app for home device management. It highlights sensor data relay to mobile devices and IoT-based fan-AC coordination.

Table 1: Literature Review

Problem Statement

Key Challenges

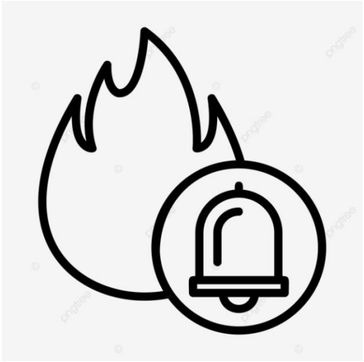
- Lacking of integration of fire detection into home automation.
- Real time monitoring and alerting system.
- User friendly interface.
- Sensors' Reliability.

Challenge Addressed

- Incorporating reliable fire sensors into IoT home systems.
- Utilizing Arduino code for Fire Sensor Monitoring and Alerts.
- User-Friendly Interface for Home Control and Alerts.

Figure 2: Reliable fire detection system with real time monitoring and user friendly also

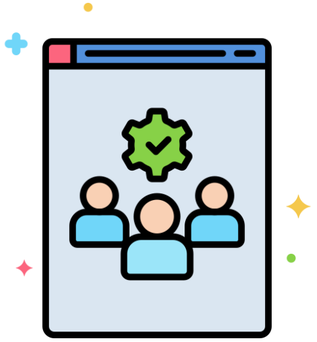
Objectives



To integrate fire detection with home automation.

To implement Real time monitoring and alerting mechanisms when fire is detected.

To develop a smartly control system for



To provide user friendly environment

Methodology

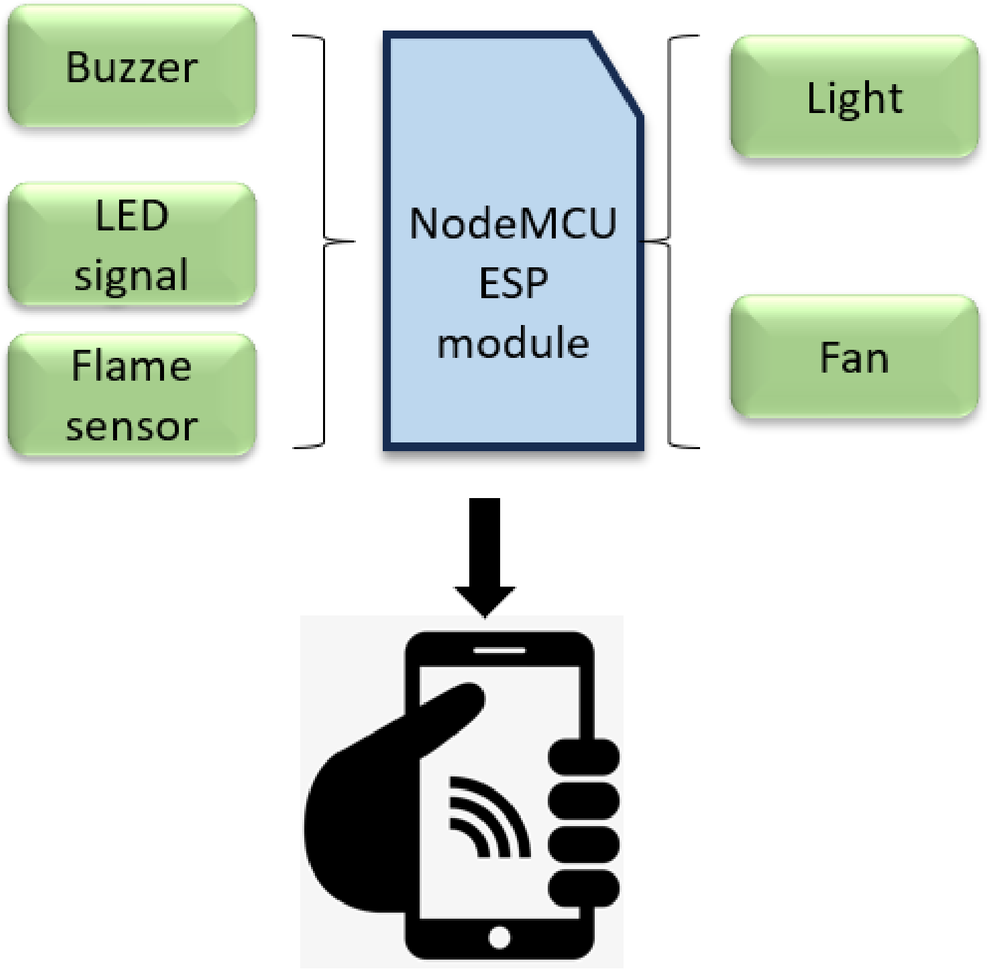


Figure 3: Basic structure of a fire detection system in an automated home management System

Methodology Cont.

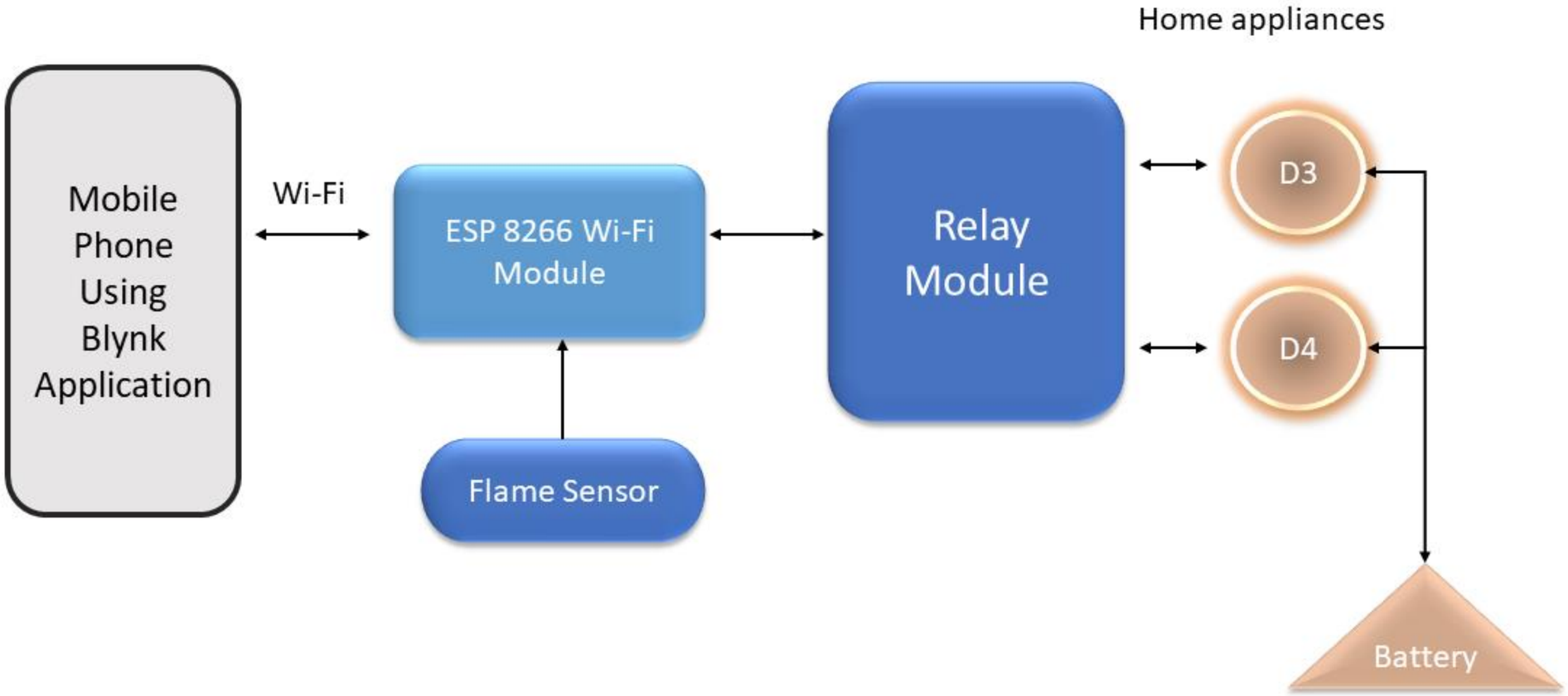


Figure 4: Work flow diagram of a fire detection system in an automated home management System

Methodology Cont.

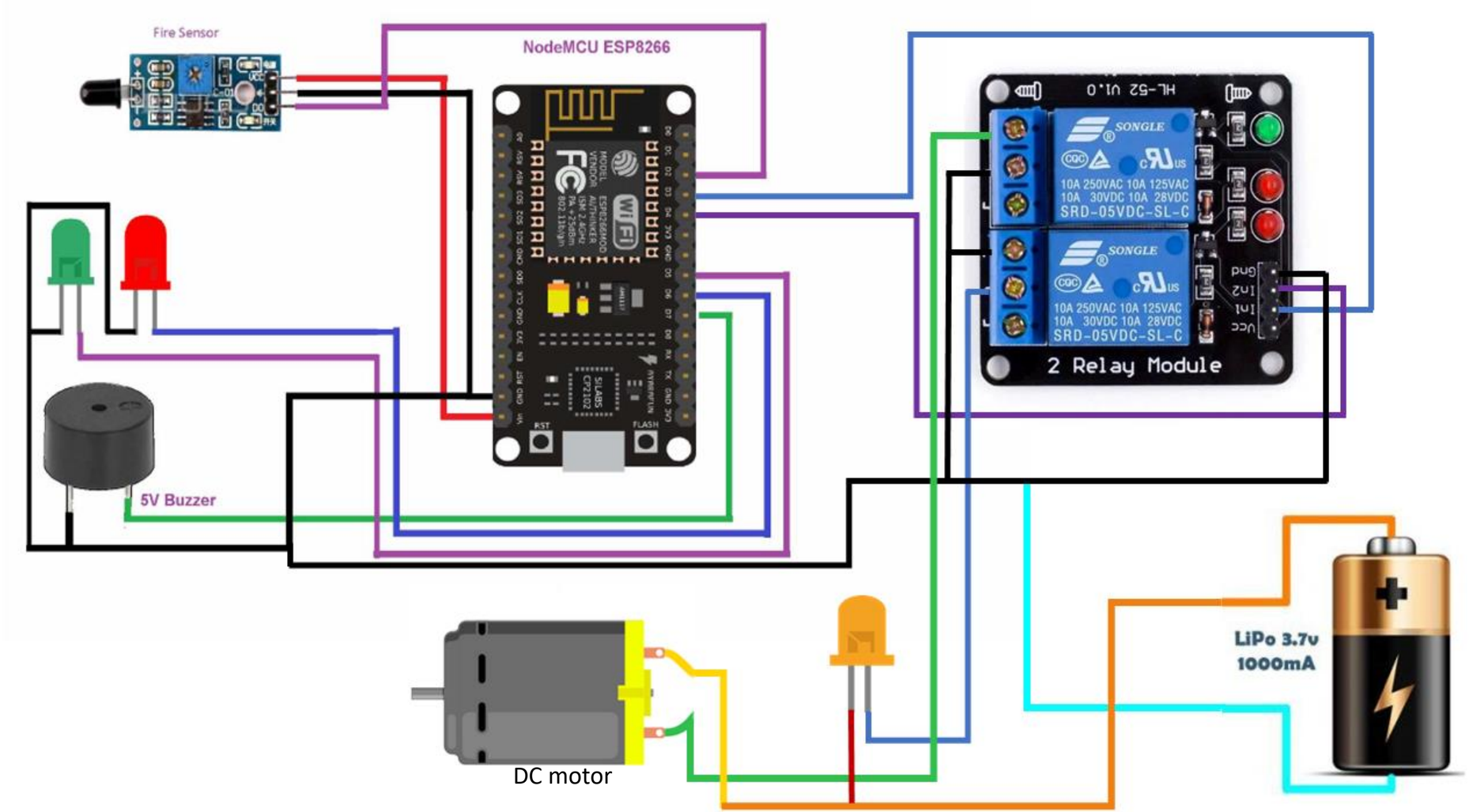


Figure 5: Connection diagram of a fire detection system in an automated home management System

Result

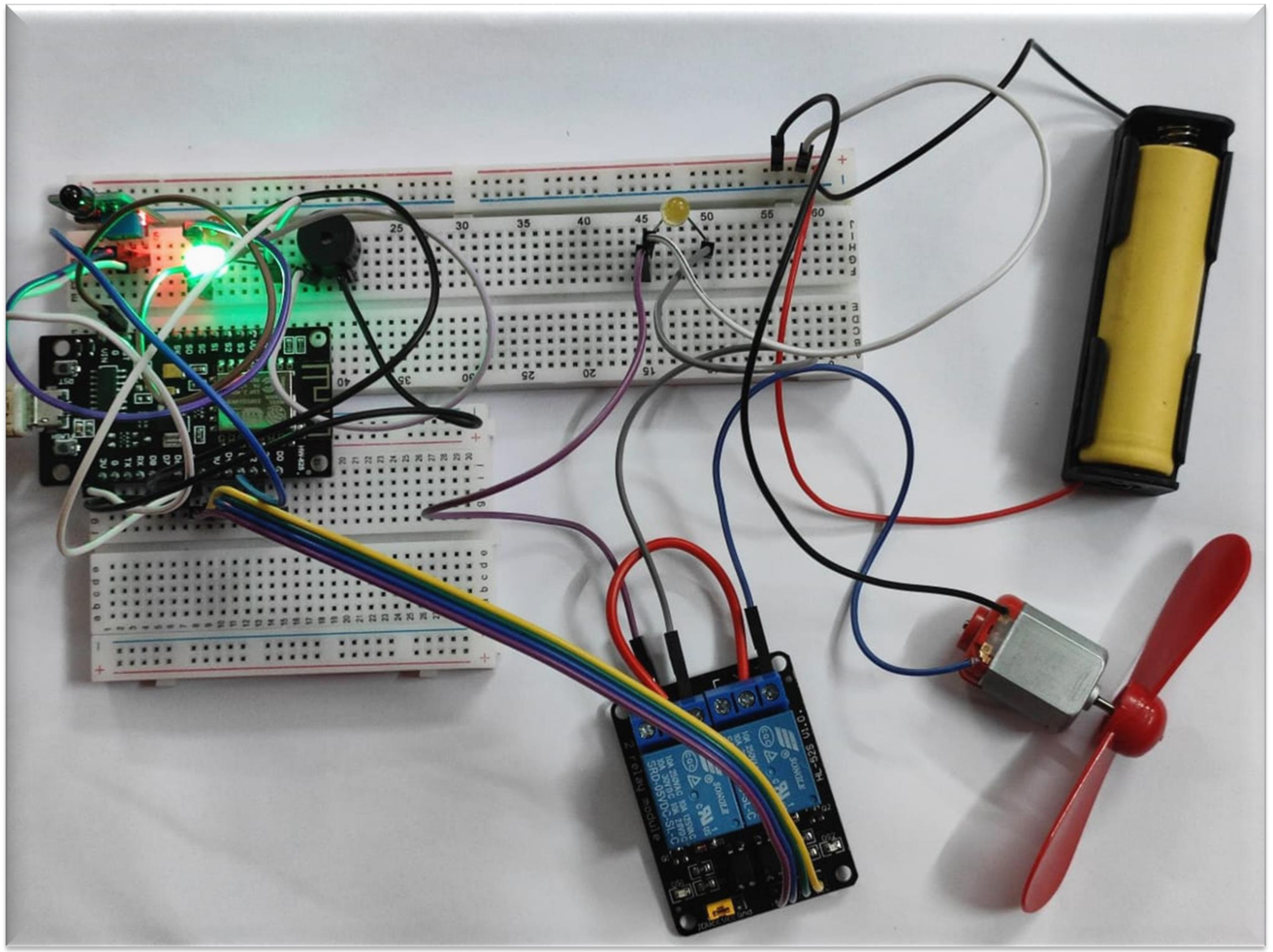
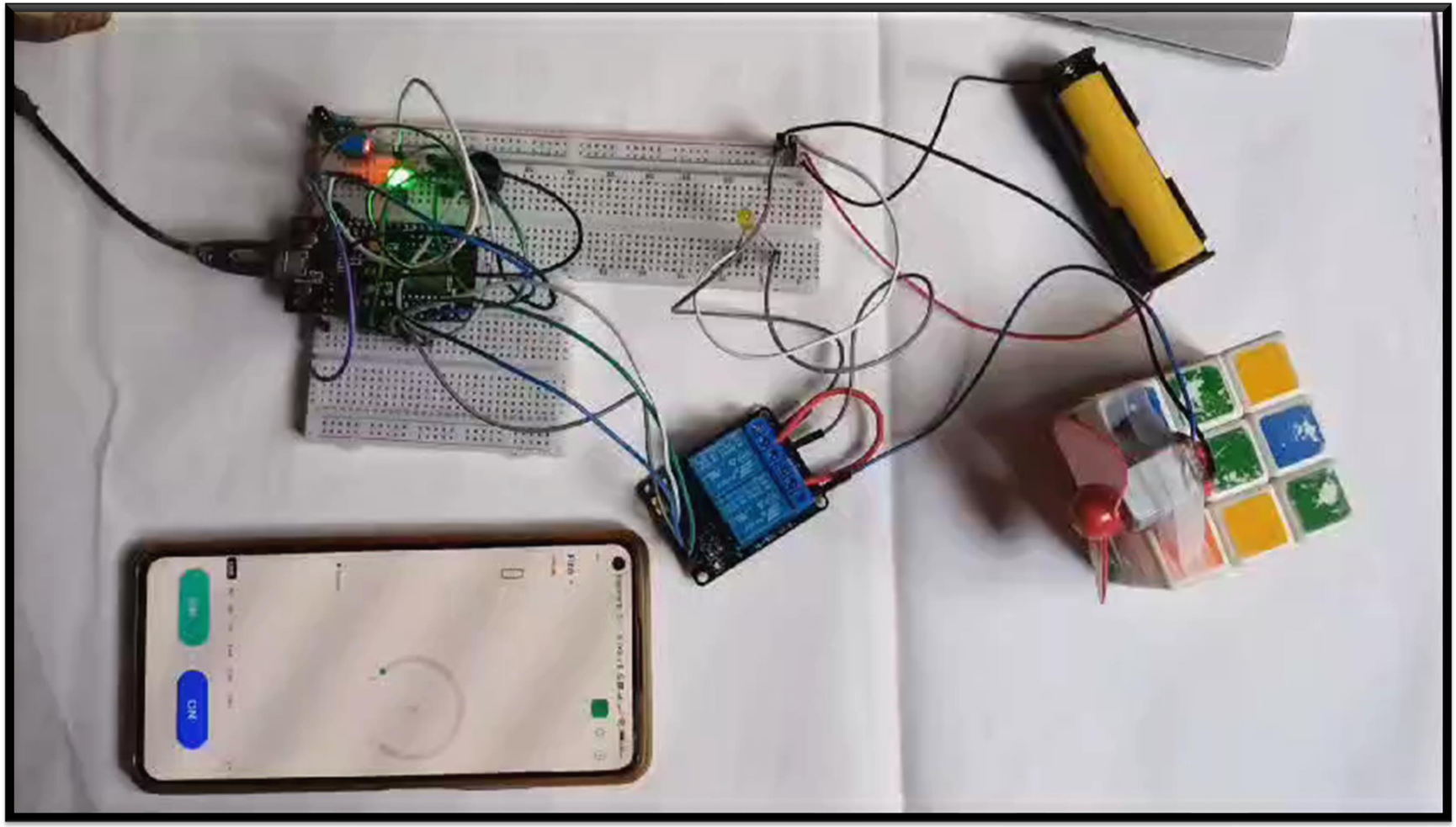


Figure 6: Implemented circuit of fire detection system in an automated home management System

Result Cont.



Video 1: Initial testing of fire detection system in an automated home management System

Result Cont.

Video 2: Final testing of fire detection system in an automated home management System

Result Cont.

(a)

(b)

Figure 7: Final testing of the system (a)Fire not detected (b) Fire detected

Future work

Enhanced sensor technology.

Multi Model detection (different such as gas sensors, smoke sensors etc.)

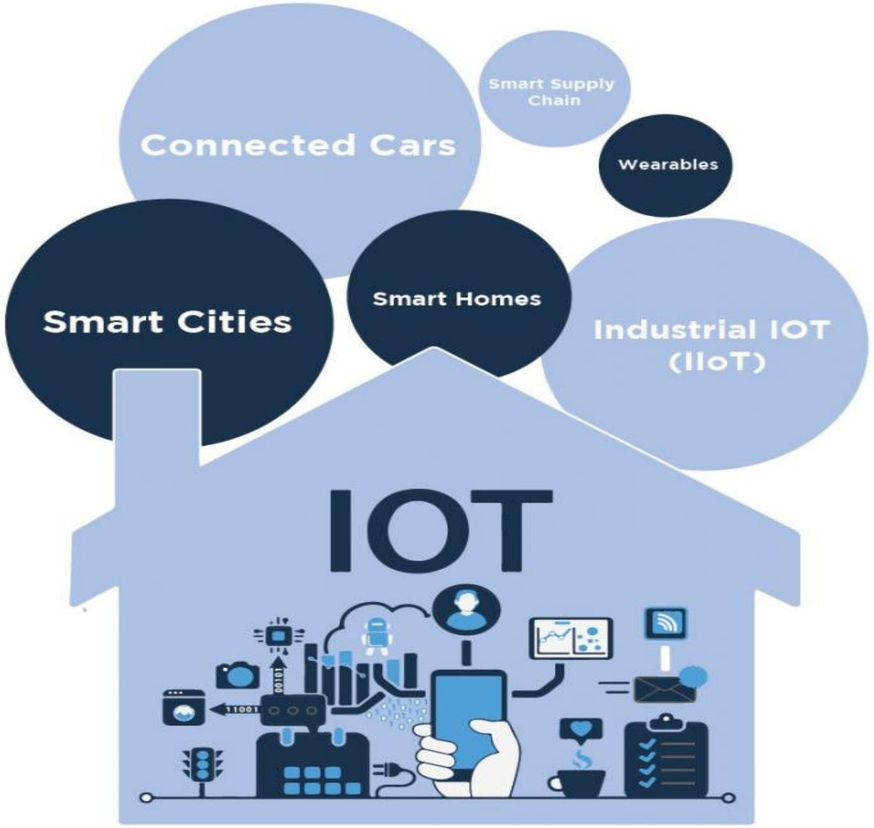


Figure 8: Multi Model detection into home automation

Budget

Si	Purchasing project materials	Quantity	Estimated Budget
1	ESP8266	1	350/-
2	Flame sensor	1	90/-
3	Buzzer	1	15/-
4	Bread Board	2	240/-
5	2 channel 5V Relay Board	1	150/-
6	Lithium-ion (Li-ion) Battery 18650 2000mAh 3.7v	1	250/-
7	Battery holder	1	50/-
Total			1,145/-

Table 2: Budget of this project

Conclusion

Enhanced safety via fire sensor integration, offering early alerts.

Convenience and efficiency with remote fire sensor monitoring.

Swift response to fire outbreaks, minimizing damage.

Scalable, adaptable system for evolving living environment

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Thank You

Any Question?