

**APPLICATION FORM: IT4030- IOT
ASSESSMENT**

1. Title	
IoT-based Fire Detection and Prevention Technologies for Ecosystem Conservation	
2. Members of the Project	
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3. Research Problem	
Exploring Internet of Things for Enhancing the Accuracy and Timeliness of Wildfire Detection Alarm Systems in High-Risk Fire-prone in Sri Lanka.	
4. Overall Aim	
The overall aim of this research is to leverage Internet of Things (IoT) technologies to advance the effectiveness of wildfire detection alarm systems in high-risk fire-prone areas of Sri Lanka. By integrating IoT devices, data analytics, and real-time monitoring, this study seeks to enhance the accuracy and timeliness of wildfire detection, ultimately contributing to improved early warning and response mechanisms, thereby reducing the potential impact of wildfires on lives and property.	
5. Objectives of the proposed work	
Objective 1: <ul style="list-style-type: none"> Temperature and Humidity Sensor: The objective is to ensure that the temperature and humidity sensor accurately captures and reports these vital environmental parameters. Display the real time sensor output data in a dashboard and enable an alarm system. 	

Objective 2:

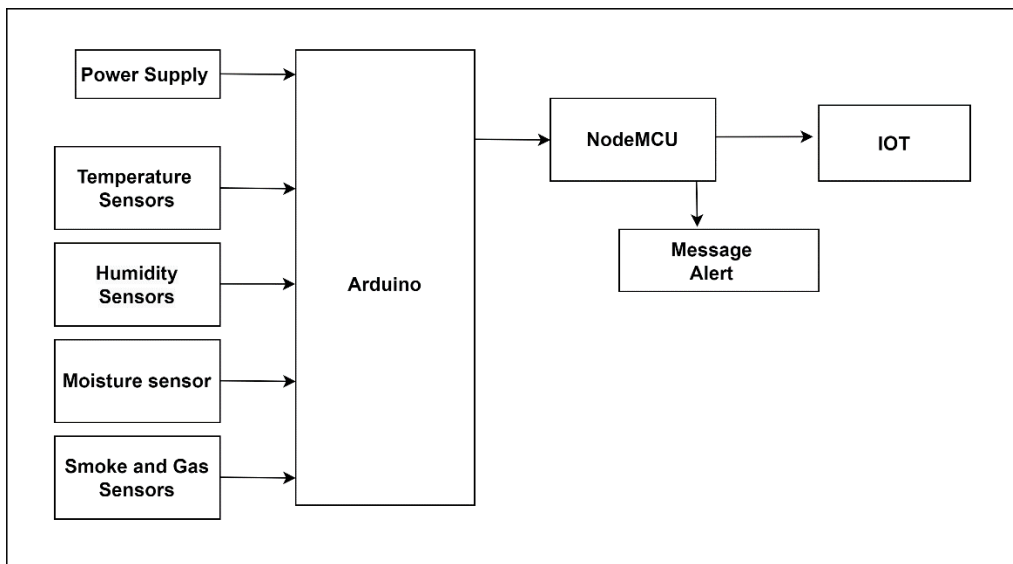
- Smoke and Gas Sensor: The objective is to optimize the smoke and gas sensor's performance to provide rapid and accurate notifications.
- Display the real time sensor output data in a dashboard and enable an alarm system.

Objective 3:

- Soil Moisture Sensor: the objective is to gather precise data across different soil types and moisture levels to accurately assess fire risk.
- Display the real time sensor output data in a dashboard and enable an alarm system.

6. Methodology (Block Diagram, Flow chart of the process and explanations)

Block Diagram



As the first step we selected the most suitable sensors for wildfire detection. To monitor atmospheric conditions, we chose the temperature and humidity sensor as our initial sensor. We selected the smoke and gas sensor to identify the existence of smoke and possibly dangerous gases connected with wildfires. We used soil moisture sensors to detect smoke particles and various gases released during combustion. This confirmation is important to avoid false alarms and ensure that a real fire event has taken place. We use Arduino and NodeMCU to obtain the output. As a pivotal safety feature, our system triggers an alarm when the temperature exceeds a predefined threshold. This alarm serves a dual purpose: it notifies individuals before a wildfire initiates and alerts them after one has occurred.

We've created a special dashboard that displays real-time information. This dashboard provides us with data to notify us before and after a wildfire. It helps us make informed decisions and keeps everyone in the loop so they can respond quickly and effectively.

7. Expected Outcome

The expected outcome of this research is the development and validation of an IoT-enabled wildfire detection alarm system tailored for high-risk fire-prone areas in Sri Lanka. This system is anticipated to demonstrate improved accuracy in detecting wildfire events, quicker notification of authorities and residents, and enhanced data-driven insights for proactive fire management strategies.