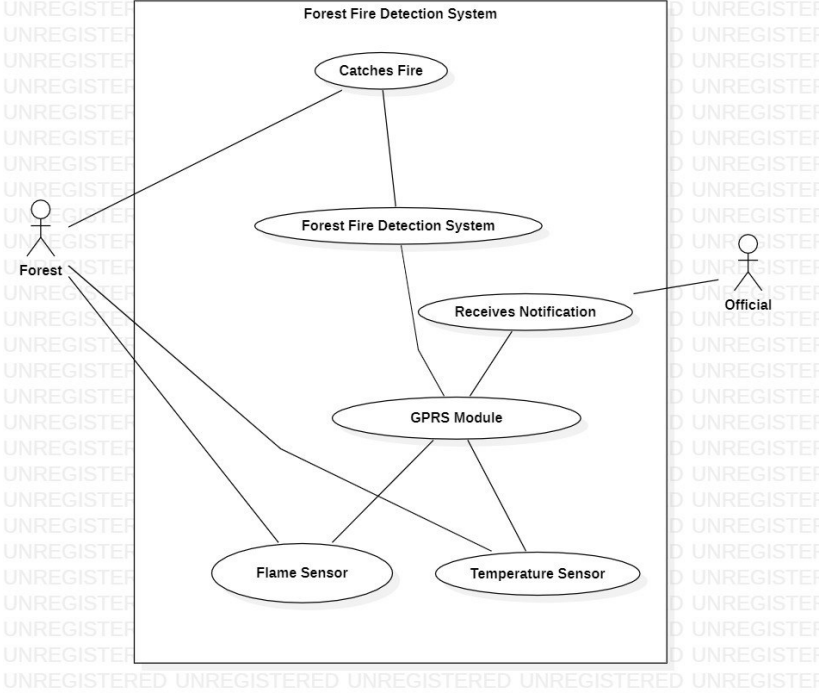
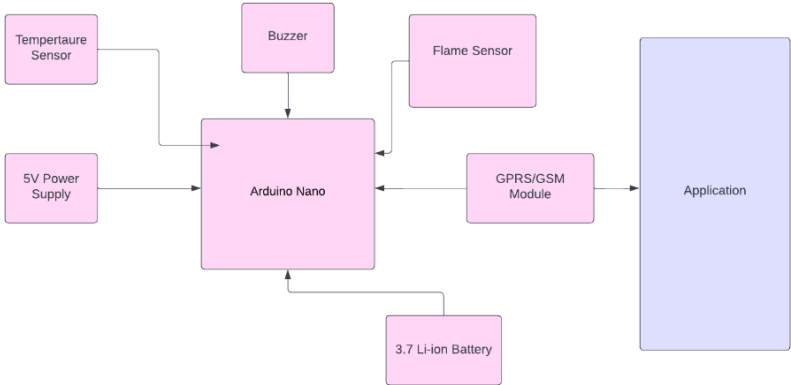


## PROJECT PROPOSAL

<b>1. Project Title:</b>	Forest Fire Detection System using Arduino and GSM Module
<b>2. Team Leader:</b>  <b>Members:</b>	Reshma S  Janani R Megasri S B Sakthi V Shabana Shree P
<b>3. Problem Identification</b>	<p>Naturally occurring wildfires are most frequently caused by lightning. There are also volcanic, meteor, and coal-seam fires, depending on the circumstances. Human caused wildfires can be accidental, intentional, or from an act of negligence. The carbon dioxide released into the air due to forest fires causes lung and skin infections in humans. Forest fires can impact the economy as many families and communities depend on the forest for food, fodder and fuel. Burning of forests causes smoke and poisonous gas emissions that result in significant health issues in humans. Loss of trees can disrupt the climatic conditions and break down the carbon chain. Wildfires damage the habitat of animals, causing them to wander in cities. Many die in the fires, unable to escape. So, to prevent this situation, we propose this Forest fire detection system using Arduino nano and GPRS/ GSM module.</p>
<b>4. Literature Survey</b> (refer minimum 15 relevant work on the problem identified )	<ul style="list-style-type: none"> <li>• Surapong Surit, Watchara Chatwiriya proposed a method to detect fire by smoke detection in which it completely based on digital image processing approach with static and dynamic characteristic analysis.</li> <li>• P. Piccinini, S. Calderara, and R. Cucchiara proposed a method based on the wavelet model and a color model of the smoke.</li> <li>• Celik (2007) proposed a generic model for fire and smoke detection without the use of sensors. Fuzzy based approach is used in this system.</li> <li>• Akshata &amp; Bhosale proposed another method where Local Binary Pattern acts as a base for fire detection and Wavelet Decomposition is used to detect fire.</li> <li>• R.Gonzalez proposed a method to detect fire based on Wavelet Transform. Stationary Wavelet Transform is used to detect Region of Interest.</li> <li>• Paulo Vinicius Koerich Borges proposed a fire detection method based on probabilistic method and classification.</li> </ul>

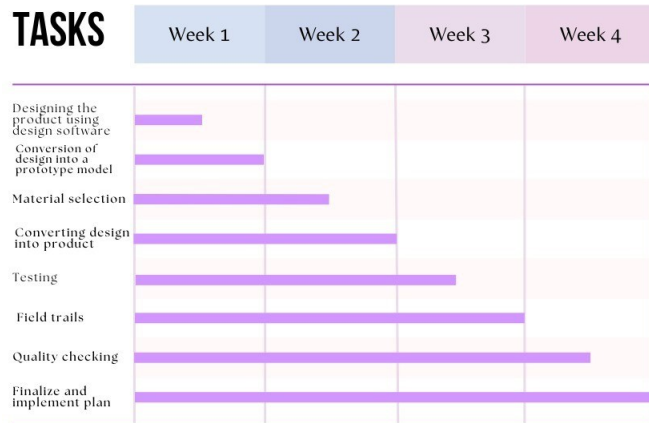
<p><b>5. Objective of the Project</b></p>	<p>Forest fires are widespread hazards in forests that threaten both wildlife and the environment. It may be averted if a strong system was installed in forest regions to detect fires and inform firefighting authorities to take timely action. The goal of this project is to create an IoT-based forest fire detection system that detects fires, temperature and sends an emergency notice to authorities. Because network bandwidth is typically very poor or non-existent in forest settings, a GSM/GPRS module is used to communicate with an IoT server. As a result, a 2G network is preferable for communicating with the server.</p>
<p><b>6. Project proposed design</b></p>	 <pre> graph TD     subgraph "Forest Fire Detection System"         CatchesFire([Catches Fire])         ForestFireDetectionSystem([Forest Fire Detection System])         ReceivesNotification([Receives Notification])         GPRSModule([GPRS Module])         FlameSensor([Flame Sensor])         TemperatureSensor([Temperature Sensor])     end     Forest((Forest)) --- CatchesFire     CatchesFire --- ForestFireDetectionSystem     ForestFireDetectionSystem --- ReceivesNotification     ReceivesNotification --- Official((Official))     GPRSModule --- FlameSensor     GPRSModule --- TemperatureSensor     Forest --- FlameSensor     Forest --- TemperatureSensor </pre>
<p><b>7. Project summary</b> Add drawings/Models/Illustrations/ Prototype images</p>	<p>Forest fires have become a major threat around the world, causing many negative impacts on human habitats and forest ecosystems. Climatic changes and the greenhouse effect are some of the consequences of such destruction. Interestingly, a higher percentage of forest fires occur due to human activities. Therefore, to minimize the destruction caused by forest fires, there is a need to detect forest fires at their initial stage. This paper proposes a system and methodology that can be used to detect forest fires at the initial stage using a Flame sensor and DHT11 Humidity and Temperature Sensor.</p> <p>The project consists of Flame Sensor, Arduino Nano &amp; SIM800L GSM/GPRS module as its primary components. The fire can be detected by the flame sensor which gives a digital output that corresponds to the Fire status and is received by the Arduino Nano.</p>

	<p>Arduino compares the signal and triggers the SIM800L in case of fire incidents.</p> <p>We have a temperature sensor which measures the temperature to find out whether temperature of the forest exceeds the usual temperature.</p>  <pre> graph LR     Temp[Tempertaure Sensor] --&gt; Arduino[Arduino Nano]     Buzzer[Buzzer] --&gt; Arduino     Arduino --&gt; Buzzer     Arduino --&gt; GSM[GPRS/GSM Module]     GSM --&gt; App[Application]     Arduino --&gt; LiIon[3.7 Li-ion Battery]     LiIon --&gt; Arduino     Arduino --&gt; PS[5V Power Supply]     PS --&gt; Arduino     FS[Flame Sensor] --&gt; Arduino </pre>
<p><b>8. Work Plan</b> Methodology</p>	<p><b>Methodology:</b> The methodology is outlined as follows</p> <ol style="list-style-type: none"> <li><b>Design:</b> The Application integrates the data from the sensor via GPRS Module.</li> <li><b>Material Selection:</b> Cost effective suitable material is selected for making the prototype. <ul style="list-style-type: none"> <li>• Arduino Nano</li> <li>• SIM800L GSM/GPRS Module</li> <li>• 3.7V Li-ion Battery</li> <li>• Flame sensor</li> <li>• Dot matrix Perf board</li> <li>• DHT11 Humidity and Temperature Sensor</li> </ul> </li> <li><b>Prototype Development:</b> Block diagram for hardware connection and their integration with the application is prototyped</li> <li><b>Testing and Trail:</b> Developed product will be tested in lab.</li> <li><b>Design review :</b> The mentor will review the developed product</li> <li><b>IP Rights:</b> File Patent of the developed product</li> </ol>

## 7. Production:

End product will be out for Production

### TASKS



## 9. Hardware specification / Software

### Hardware Specifications:

- Arduino Nano
- SIM800L GSM/GPRS Module
- 3.7V Li-ion Battery
- Flame sensor
- Dot matrix Perf board
- DHT11 Humidity and Temperature Sensor