Problem Description

Smart Fire Alarm System Modern homes are at an increased risk of rapid-fire spread and destruction due to engineered building material and hazardous household items. Traditional fire alarms do not provide the adequate functions to quickly respond to a fire. A smart fire system needs to be developed that can quickly sound an alarm and alert the User and local fire department within 30 seconds of a fire being detected. The user is notified through an external app. If the system cannot contact the fire department, it needs to notify the user that it could not connect with the fire department. Additionally, if the homeowner does not acknowledge a fire notification, an emergency contact should also be alerted. The alarm system should execute an initial response to minimize damage and save lives. The system should also be connected with other systems, such as the sprinkler system. In standard sprinkler systems, the sprinkler is triggered only when the heat sensor reaches a high enough temperature that the fire is directly in the vicinity of the sprinkler system. However, when a fire is detected, the system should notify the sprinkler system so it can lower the temperature threshold so the sprinkler system can be triggered just before the fire reaches that particular location, ensuring a faster fire response. If the system detects a low battery or a sensor failure, it needs to notify the user so they can immediately address the issue. In addition to the smoke and heat sensors, the smart fire alarm should also have a carbon monoxide sensor built-in to protect the home from dangerous levels of CO. The system should also allow the user to configure the alarm settings and manually turn the alarm off if the alarm was triggered, but there was no fire.

Newly added functionalities

Silent Alarm Mode for False Alarms:

- Add a silent alarm mode that the user can activate during known false alarms (e.g., cooking smoke), which prevents the sound alarm but keeps the system alert for further detections.

Video Surveillance Integration:

- Equip the system with the capability to integrate with smart video surveillance systems. In the event of a fire, video feeds can be accessed to provide real-time visual confirmation to the user and the fire department.