REAL-TIME SMOKE DETECTION INSIDE CARS USING INTERNET OF THINGS

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Abstract:- Cigarette smoking is considered as a bad habit since, it is having a bad impact on health and also for the Environment. Nowadays, most of the people are using cars for their transport purposes and we already know that cars are mostly closed area, so, the environment in the car should be healthy and drivers should drive safely. Humans can be affected by Second hand smoke and Third hand smoke. This Hear Smoking is a smoking detection system in the car, which detects the smoking events inside car and notifies to the owner of the car and also stops the motion of the car. Using Internet of Things, we are going to implement this system inside the car which gives alert messages to the owner of the car, whenever the people inside the car or the driver smokes. This system can be beneficial to keep the environment in the car healthy and can be helpful for safe driving. For this, we will be using Arduino programming and mainly MQ2 and MQ135 sensor to detect smoke

1. INTRODUCTION

1.1 GENERAL

The increasing adoption of Electric Vehicles (EVs) has brought about significant advancements in automotive technology, promoting cleaner and more sustainable transportation options. However, as with any technology, EVs present unique challenges, one of which is the risk of battery-related incidents such as fires. The safety of EV batteries is paramount, not only for vehicle occupants but also for the surrounding environment and infrastructure. Early detection of potential fire hazards in EV batteries is crucial for preventing catastrophic events and ensuring the continued safety and

reliability of electric vehicles. Traditional methods of fire detection in EV batteries often rely on basic sensors and monitoring systems, which may not always provide timely and accurate warnings.In recent years, the integration of Internet of Things (IOT) devices and Machine Learning(ML) algorithms has emerged as a promising approach for enhancing the safety and efficiency of various systems, including EVs. By leveraging IOT sensors for real- time data collection and ML algorithms for predictive analysis, it becomes possible to detect and mitigate fire risks in EV batteries more effectively. This paper explores the application of a Machine Learning approach combined with IOT technology for the early detection of fire hazards in EV batteries. We delve into the challenges associated with current fire detection methods, discuss the advantages of using IOT-enabled sensors for data acquisition, and highlight the potential of ML algorithms for analyzing complex datasets to identify precursors to battery fires. Furthermore, we present a framework for implementing an integrated IOT-Machine Learning system for fire detection in EV batteries, outlining the key components, data processing pipelines, and predictive models involved. Additionally, we discuss the implications of early fire detection on EV safety, reliability, and overall adoption.Overall, this paper aims to provide insights into the role of IOT and Machine Learning in improving the safety of Electric Vehicles,particularly in the context of early fire detection in battery systems. By leveraging advanced technologies and data-driven approaches, we can mitigate risks, enhance performance, and accelerate the transition towards a sustainable future of transportation.

2. LITERATURE SURVEY

2.1 EXISTING SYSTEM

Current smoke detection systems in cars are either non-existent or rely on basic smoke detectors that operate independently without real-time data transmission. These systems often lack the capability to send immediate alerts to the driver or remotely notify emergency services. As a result, smoke-related incidents inside cars may not be detected promptly, potentially leading to severe safety hazards

2.2 PROPOSED SYSTEM

The proposed system employs IoT technology to enable real-time smoke detection inside cars. This system integrates smart smoke sensors that continuously monitor the car's interior for any signs of

smoke. Upon detection, the system instantly sends alerts to the driver and remotely notifies emergency services through a connected mobile app. This real-time monitoring and alerting capability significantly enhances the safety of vehicle occupants by ensuring prompt detection and response to smoke-related incidents.

3. BLOCK DIAGRAM

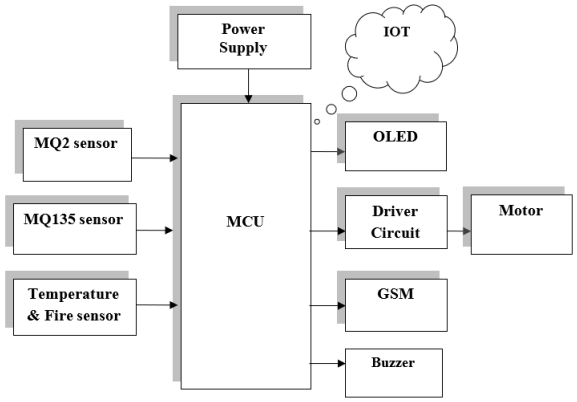

FIG: 1 Block diagram

3.1. HARDWARE COMPONENTS

- Regulated power supply.
- Micro controller.
- Voltage sensor
- Current sensor
- Temperature sensor

3.2. SOFTWARE REQUIREMENTS:

- Embedded C

4. IMPLEMENTATION

Humans can be affected by Second hand smoke and Third hand smoke. This Hear Smoking is a smoking detection system in the car, which detects the smoking events inside car and notifies to the owner of the car and also stops the motion of the car. Using Internet of Things, we are going to implement this system inside the car which gives alert messages to the owner of the car, whenever the people inside the car or the driver smokes. This system can be beneficial to keep the environment in the car healthy and can be helpful for safe driving. For this, we will be using Arduino programming and mainly MQ2 and MQ135 sensor to detect smoke

5. CIRCUIT DIAGRAM

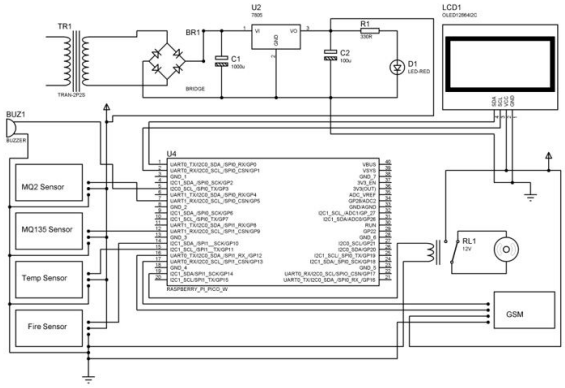

Fig circuit diagram

6. RESULT

This project is well prepared and acting accordingly as per the initia specifications and requirements of our project. Because of the creative nature and design the id of applying this project is very new, the opportunities for this project are immense. The practical representation of an experimental board is shown below:

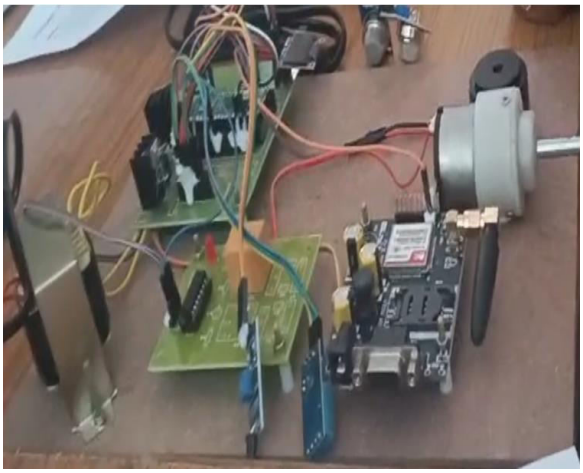

Fig:3. Project Model

6. CONCLUSION

EV Control Systems have migrated from being dedicated, air-gapped, centralized infrastructures and have adopted the distributed, corporate systems accessible via the Internet. Although the efficiency, speed, precision quality is increased, this has exposed ICS to the unsecured Internet. Monitoring System for battery pack already designed and able to work well. Balancing cell is an action to prevent damage to the battery pack caused by voltage different between cells. Because the difference in cell voltage can make the lifetime of the battery decrease and break down quickly. Although the efficiency, speed, precision quality is increased, this has exposed DL to the IoT. The proposed machine learning-based data analysis approach enables proactive and data-driven battery management strategies, leading to improved reliability, efficiency, and longevity of battery systems across various applications, including electric vehicles, renewable energy storage, and portable electronics

7. REFERENCES

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