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Real-Time Vehicle Accident Prediction and Rescue Solution Using IOT

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ABSTRACT

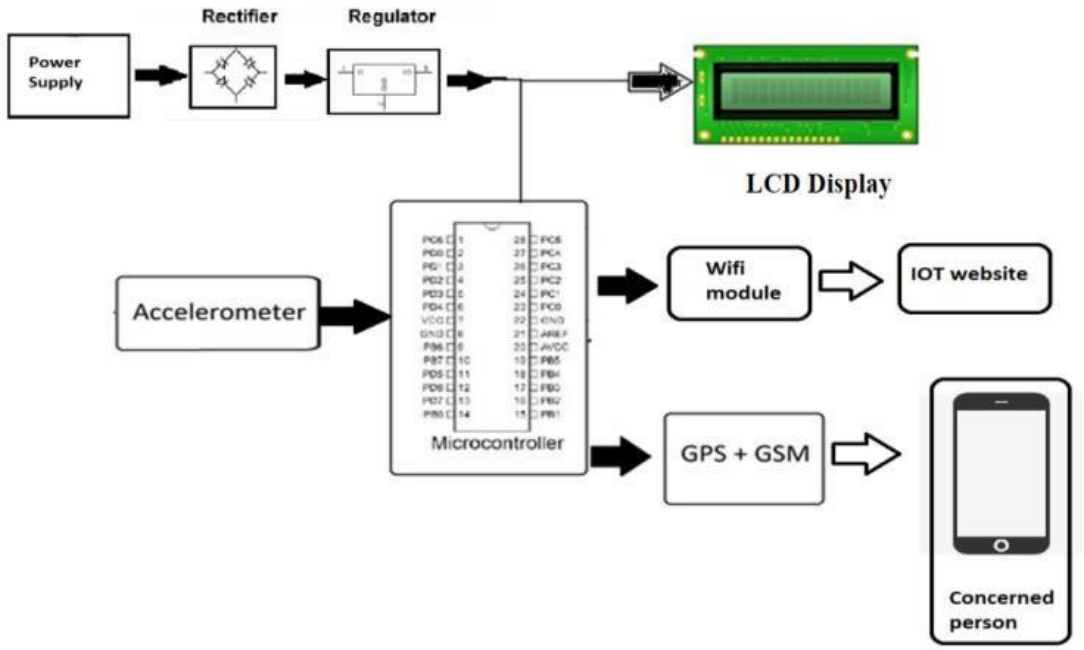
Traffic in our country is increasing day by day. Individuals are not showing an adequate response towards traffic rules in various parts of the country. Most of all, accidents are happening due to over speed and negligence. Especially, individuals are reducing speed to its extent in the school and college zone. This is ingrained project to indicate the over speed and to regulate the vehicle in the condition of over speed. This is made with the wireless communication. We are using IOT which is Programmable microcontroller, to sense the vibration of vehicle and Diesel/Petrol leakage, we interfaced vibration sensor indicate the happening of accident and gas sensor indicated the leakage of Diesel/Petrol.
Vehicle motors are turned off automatically in case of a gas leak found. Accident data system will notify vehicle owner relative or nearby hospital through IoT with accident location using GPS. If it is minor accident then the driver can press reset switch and drive as usual. We can monitor and control all this with the help of IoT module.

Keywords: IOT, Vibration Sensor, Gas Sensor, Buzzer, GPS Module, DC Motor.

INTRODUCTION

The major objective of this project is to develop the prototype of vehicle accident and fuel leakage detection to install in any vehicle globally. The road accidents are taking place in various cities. Currently, the cause of death is increasing more because of accident. The main cause of this accident is driver negligence, speeding and alcohol is the most notable feature of vehicle accident affordability and energy efficiency, is a reliable site for hosting Next cloud. Accident and fuel spill detection can assist in the development of safer vehicles, improve the treatment of victims of crashes, aid insurance companies with vehicle crash analysis, and enhance road status in an effort to lower the percentage of death.
According to the World Health Organization, more than a million individuals in the world lose their lives annually as a result of accidents related to transportation. If this system detects an accident and the system will continuously update the gps location to the cloud. Then IOT microcontroller is comparing this value with the threshold limit this threshold limit is 30% or 40%. After crossing this threshold limit then the IOT microcontroller activates the buzzer and relay both. This Buzzer and Relays remain on as long as there is a leakage of fuel and alcohol percentage is greater than the required quantity.

PROPOSED APPROACH



This type of system works by constantly checking sensor readings on cars and sophisticated algorithms picking up on anomalies that indicate a crash. Strategically located sensors track the vehicle's sudden change in direction, impact energy, and key passenger vital signs to allow for early detection of accidents. The system starts with an AC-to-DC power supply unit through a rectifier to provide a stable voltage supply and stability and prevention against fluctuations that will harm components through a voltage regulator. The processing unit in the heart of the system is a microcontroller that processes data from the accelerometer sensor, which senses sudden vibration or movement as a sign of possible crash. When an anomaly is detected, the microcontroller accordingly responds, e.g., displaying system and event data in real-time on an LCD screen.

The system is comprised of several communication modules, e.g., a Wi-Fi module for sending accident data to an IoT web page for off-site monitoring. A GPS-GSM module is equally crucial in handling accidents by pin-pointing the location of an accident site based on GPS and sending an automatic alert message including coordinates of a location to previously configured emergency contacts or organizations based on GSM. The integration with IoT enables the possibility of reaching the information relating to an accident in real-time, enabling respective parties to receive notifications simultaneously. In case of an accident, the alert system automatically alerts emergency responders or family members, enabling quick response that can save lives. Through the application of sensor-based accident sensing, real- time communications, and IoT connectivity, the system increases car safety, offering car owners a safe and convenient way of accident monitoring and response.

RESULT

Application of the Real-Time Vehicle Accident Prediction and Rescue Solution Using IoT has exhibited significant improvement in accident detection, emergency response, and real- time monitoring. The system is efficient in receiving and processing onboard sensor data to detect anomalies based on changes in vehicle orientation, impact forces, and passenger vital signs, in a bid to early detect accidents. The accelerometer sensor detects sudden motion correctly, and the

microcontroller processes at high speed to differentiate between small shocks and hard crashes. Upon detecting an accident, the system sends alarm messages through GSM immediately to pre-stored emergency numbers like relatives, ambulance, or police, and the GPS module provides correct real-time location coordinates to enable immediate emergency response. Apart from that, the inclusion of IoT has real-time logging of data and remote monitoring where the accident information can be viewed by authorized people through a web interface or mobile application. This not only gives instant response but also makes possible accident trend analysis for the sake of improved road safety procedures. Hardware elements such as the power supply unit, rectifier, and voltage regulator provide stability with no sort of fluctuation whatsoever which would be a threat to system performance. The LCD display provides useful information about the status of the system in the proper way, assisting in improved user perception. The system overall properly maximizes vehicle security through a guaranteed, automatic system for crash detection, prompt notification, and emergency response coordination that can save lives literally by providing faster interventions.

CONCLUSION

This project introduces vehicle accident and fuel leakage detection system. A clear and comprehensive description was provided for each component of this system. This paper has also provided a user Internet of thing-based data of the accident. In addition, the transmission mechanism between the two components has been proposed and designed. The vehicle system developed can be implemented on any vehicle. The moment the motor is supplied by the driver, this system will start saving the events of the concerned vehicle.

The last 21 seconds are always saved in the Vehicle accident and fuel leakage detection's EEPROM, and if there is an accident, the next 10 seconds of events following this accident will be saved also. The saved data can be retrieved only after the accident for privacy reasons. By serial transmission, the PIC program will present the data in EEPROM to the user in Graphical form on the cloud server. The user will also be provided with a complete report with all the information required

Declaration by Authors

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