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IOT Cloud Based Real Time Automobile Monitoring System

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ABSTRACT

Smart sensing has had a significant impact on defining our future in recent years. The field of IOT is a recent technical innovation that has caused a change in lifestyle (Internet of things). IoT refers to the internetworking of physical equipment and other items that are equipped with electronics, software, sensors, and network connectivity to allow data to be collected from them. Transportation is a booming industry in India, with the number of vehicles on the road increasing by the day. Monitoring vehicle metrics such as gasoline, temperature, and battery level without having to touch the car is perfect. In this digital age, a digital locking mechanism is desperately needed. When your vehicle is not with you, vehicle tracking is also essential. Here, car tracking is designed using GPS to conveniently locate the user's vehicle. The IoT cloud-based real-time automotive monitoring system is capable of monitoring our vehicle's metrics such as fuel level, battery level, engine temperature, and speed, as well as tracking the driver's alcohol percentage via an Android application. We receive an alert when one of these metrics crosses a certain threshold. Its Smart RFID digital key secures your vehicle even more than keys do. We may save our vehicle documents, driver's licences, insurance copies, and other documents in this project's Android application. Whenever an accident occurs, send a message to trusted people with the location.

Keywords-- Internet of Things, Microcontroller, RFID, WIFI Module, Sensors, Vehicle Monitoring

I. INTRODUCTION

IOT is one of the most useful technologies in today's world. The term "Internet of Things" refers to embedded devices that are connected to the internet. Sensors, actuators, motors, and other devices are included in the Internet of Things. People's primary worry nowadays is the security of precious items such as automobiles. The use of an RFID ignition key and GPS improves security. The proposed method is employed as an anti-theft technology in public transportation networks. To identify an accident and the proportion of alcohol in the blood, various sensors are utilised. The data from the sensors is stored in the Google cloud by the Thing talk channel. It allows you to visualise and analyse real-time sensor data. Automobile owners can use this data to visually monitor sensor data from anywhere in the world.

II. RELATED WORK

When the car is lost, a variety of technologies are used to control it. Previously, determining the location of a car was challenging, but with the advent of GPS technology, tracking the whereabouts of a car has become much easier. A system is designed to keep track of the vehicle's location and provide the information to the owner. GPS and WIFI modules are used in this system to determine the vehicle's location and communicate the information to the owner.

This system is intended to provide continuous vehicle monitoring as well as a description of the car's state and the driver's alcohol level upon request.

III. PROPOSED SYSTEM

This paper describes a system that uses GPS and WI-FI module technologies to track a car that has gone missing. The commands are delivered by the Arduino UNO controller to the GPS receiver and WI-FI module. This system is permanently installed inside a car. The GPS module will provide the location information to the controller. The controller will receive it and send it to the vehicle's user through WI-FI modem. Using a mobile web page, the owner can now take appropriate action. RFID

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technology is utilised to provide security to the system that is installed inside the car. The data from the sensors is stored and visualised using IoT technology.

A. Block Diagram

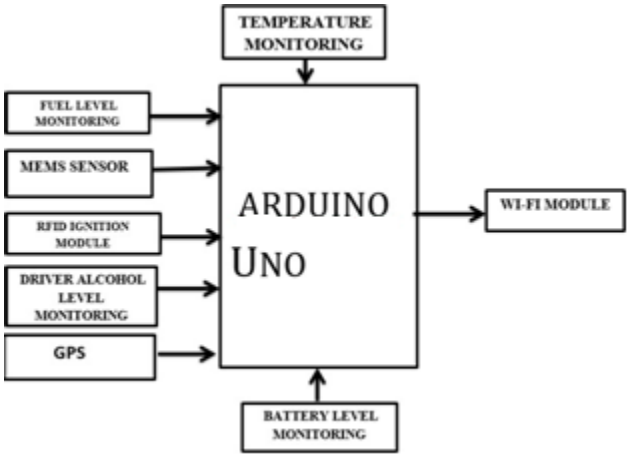

Figure 1: Functional pattern of automobile monitoring system

The above image shows a block diagram of automobile monitoring system which is implemented using a GPS and WI-FI Module platform. It contains Arduino, GPS, RFID, sensors, ESP8266 modules.

B) Interfacing Device

i) Arduino Uno

UNO ARDUINO ARDUINO ARDUINO ARDUINO The microcontroller is the most important component of the automotive monitoring system. The Arduino UNO is a microcontroller with open access. The Arduino controller board has 16 input and output pins for connecting to embedded devices. It operates at a voltage of 5 volts. It has 32KB of flash memory and 2KB of static RAM. In the Arduino IDE, the embedded c language can be used to programme the Arduino controller.

Figure 2: Arduino Uno Board

ii) GPS Module

The signals are traced using satellite technology via the Global Positioning System. It is based on the 2D trilateration idea. When an object transmits signals to satellites, the satellites return the feedback signals to the item.

To determine the geographical position of the object, the time necessary to send the feedback signal is determined. The Global Navigation Satellite System network is used by the GPS tracking system to track the exact location of the vehicle. Vehicle tracking systems are divided into two categories: passive and active. Active tracking systems monitor and communicate information to a central tracking portal, whereas passive tracking systems monitor and store data.

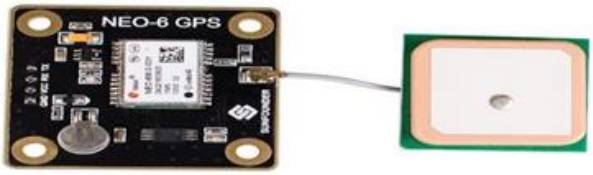

Figure 3: GPS Module

iii) RFID Technology

The electromagnetic field is used in radio-frequency identification. The tags or objects are scanned using radio frequency technology. RFID technology is utilised for automatic detection and data collection. Even at distances of hundreds of metres, passive tags can function. It is not necessary for the object to be in direct line of sight.

Figure 4: RFID Module

iv) Alcohol Sensor

The MQ-3 gas sensor's sensitive substance is SnO2, which has a reduced conductivity in clean air. When the target alcohol gas is present, the sensor's conductivity increases in tandem with the increase in gas concentration. MQ-3 gas sensor has a high sensitivity to alcohol and is resistant to fuel, smoke, and vapour disturbance. The sensor can detect alcohol at various concentrations, is modest in cost, and may be used in a variety of applications.

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Figure 5: Alcohol Sensor

v) Temperature Sensor

A temperature sensor is an electronic device that records and monitors temperature changes by measuring the temperature of its surroundings and converting the input data into electronic data.

Figure 6: Temperature Sensor

vi) Float Level Sensor

Continuous level sensors with a magnetic float that rises and falls as liquid levels change are known as float level sensors. The float's movement generates a magnetic field that activates a hermetically sealed reed switch in the level sensor's stem, causing the switch to open or close.

Figure 7: Float Level Sensor

vii) Battery Level Sensor

Battery level indicator will let you know the status of battery of a device just by glowing the number of LED's.

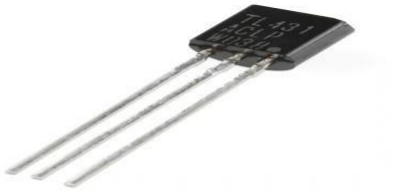

Figure 8: Battery Level Sensor

viii) MEMS Sensor

Micro-electromechanical System Sensor is the abbreviation for Micro-electromechanical System Sensor. It's also known as an accelerometer since it detects acceleration along the X, Y, and Z axes. It's utilised to detect an abnormal tilt in the object it's attached to. When the sensor is tilted, the suspended mass causes an electric potential difference, which is detected as a change in capacitance.

Figure 9: MEMS Sensor

ix) WI-FI Module

The ESP8266 is a low-cost Wi-Fi microchip that includes a full TCP/IP stack as well as a microcontroller.

It's used to connect to the internet via Wi-Fi. Microcontrollers can connect to a Wi-Fi network and make simple TCP/IP connections with this little module. It requires a power supply of +3.3 volts.

Figure 10: WI-FI Module

x) LCD Display

To display interactive messages, we are using LCD Module. We examine an intelligent LCD display of two lines, 16 characters per line that is interfaced to the controllers.

2*16 line LCD Display

Figure 11: LCD Display

IV. METHODOLOGY

Using IoT technology, the automobile monitoring system is meant to monitor the vehicle's many metrics. The fuel level monitoring module is used to monitor the vehicle's fuel level, and if the level drops below the threshold value, a notification is sent to the vehicle's

owner. Each module is used to monitor each vehicle parameter and store real-time values in the Arduino Uno in this manner. With the help of a WI-FI module, these data can be viewed on a webpage, and the vehicle's performance may be virtually examined. We have an RFID ignition module that is used to lock and unlock the vehicle. It is utilised to increase the vehicle's security. When an accident occurs or a vehicle is lost or hidden, GPS is utilised to pinpoint the exact location of the vehicle. Fuel, temperature, battery, and driver alcohol monitoring are all used here.

V. RESULT & CONCLUSION

In today's world, the most important issue is to ensure the safety and performance of private and public vehicles. As a result, an IoT cloud-based real-time Automobile monitoring system is presented to locate the exact location and virtual performance of the car when it is missing or has a problem. The GPS technology is used to track the location of the car, and additional modules are used to monitor the car's parameters, with the data being relayed to the user via a web page. It's generally used in fleet management, transportation systems, military applications, school buses, and public transit, among other things.

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