

Smart phone application for Vehicle Assistant System

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Abstract :There are many parameters based on which a driver's performance should be analyzed during the driving state. In the prevailing system, few important parameters are missing. We represent an alternative method of assessing driving skills of the driver while his driving state. It will also help in enhancing driving skills and help in reducing the no. of accidents caused by driver's mistake. This makes use of some of the sensors such as Accelerometer, Gyroscope etc. for checking the driving style and rash driving. To alleviate air-pollution caused by vehicle emission different vehicle inspection programs have been introduced. However these emission tests are usually cost-ineffective and time-consuming. This paper proposes a new vehicle emission inspection system to monitor the engine health through the concept of Internet of Things. Here we use various gas sensors for checking emission and at last also provide navigation. Reducing vehicle emission from motorized transportation areas plays a significant role in improving urban air quality and decreasing atmospheric greenhouse gases. Microscopic vehicle emission models, such as Comprehensive Model Emission Model (CMEM) and Motor Vehicle Emission Simulator (MOVES), have been well developed to calculate vehicle energy consumption and emission precisely. However, these models require second-by-second vehicle trajectory data as a key input to perform vehicle emission estimation. In recent years, due to the technical advances in mobile devices, large scale vehicle trajectory data are available through mobile sensors, such as probe vehicles equipped with Global Positioning System (GPS). Data collected by GPS include coordinated universal time, global positions (latitude longitude) and speed of vehicles at certain frequency.

Keywords: Arduino UNO & Genuino UNO, ESP8266 ESP-01, Gas sensor MQ135, LCD16*2

1. INTRODUCTION

In many urban areas, vehicle emissions have been recognized as one of the major contributors to air pollution that can pollute the environment and cause public health issues.

Apart from vehicle emission rash driving and over-speeding is also a major concern which takes the life of millions over the years. Rash-driving and Over-speeding is a major moving traffic violation. It is usually a more serious offense than careless driving, improper driving, or driving without due care and attention and is often punishable by fines, imprisonment or driver's license suspension or This type of driving is often defined as a state in which the driver disrespects the rules and regulations of the road and causes trouble to himself as well as the others; the driver misjudges common driving procedures, often

causing wrecks, accidents and other damages that seems to be fatal in most cases. Most of the times it is being observed that driver drives more than the speed-limit on the expressway, highway and also overtaking and rash-driving on the single lanes which also contributes to the accidents.

2. PROPOSED SYSTEM

Air pollution has become a common phenomenon everywhere. Specially in the urban areas, air pollution is a real-life problem. In the urban areas, the increased number of petrol and diesel vehicles and the presence of industrial areas at the outskirts of the major cities are the main causes of air pollution. The problem is seriously intensified in the metropolitan cities. The governments all around the world are taking every measure in their capacity. Many European countries

have aimed to replace petrol and diesel vehicles with the electric vehicles by 2030. Even India has aimed to do so by 2025. The main aim of this project is to develop a device which can monitor PPM in air in real time, tell the quality of air and log data to a server.

In this vehicle assistant system we are designing an Android application which will be beneficial for judging the driving style of the vehicle by the driver as well as harsh driving. We are also providing a vehicle emission control system to control the amount of pollution done by the vehicles. As the vehicle moves, the sensors present on it will start working and sense the speed of the car and do speed estimation and also the driving.

The vehicle emission control system will make use of Arduino (micro-controller) and various gas sensors like H₂, gas sensor. At the last there will be a map for navigation to the user which will send him from one place to another on basis of judging the shortest path

Advantages:

1. System can find vehicle engine health. 2.

System can detect rash driving

3. System reduces air pollution.

4. System reduces accidents.

5. Limiting your vehicle emissions can help you to reduce your environmental impact and benefit your business. Emissions from vehicle exhausts are a significant source of air pollutants including:

* CO₂ * Carbon monoxide * Fine Dust particles * Nitrogen oxides * Unburnt Hydrocarbons

6. Due to its low cost, it is very easy to integrate into other technologies like cell phone.

7. The GPS is extremely easy to navigate as it tells you the direction for each turn you take or you have to take to reach to your destination.

8. The Navigation system provides the layout of roads, the locations of cities and towns, state boundaries, geographical features, restaurant reviews and satellite images.

9. It can reduce PM₁₀ emissions by a factor of

10. It reduces disease like Asthma, Cancer, Lungs disease, Brain disease, and other respiratory problems in children caused by vehicle emission.

3. PROPOSED SYSTEM ARCHITECTURE

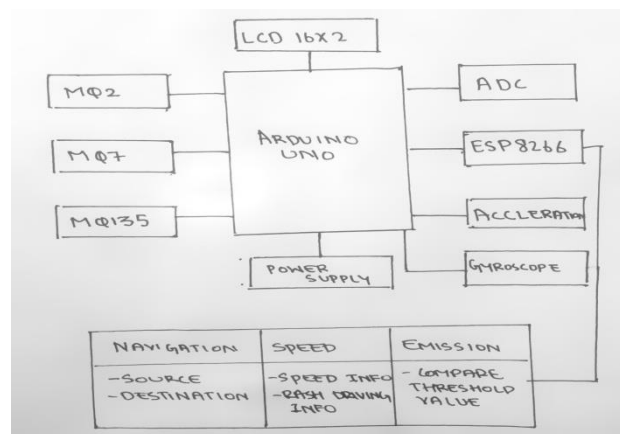


FIG [1]: SYSTEM ARCHITECTURE

1. Arduino Uno

Arduino Uno is one of the most popular prototyping boards. It is small in size and packed with rich features. The board comes with built-in Arduino boot loader. It is an Atmega 328 based controller board which has 14 GPIO pins, 6 PWM pins, 6 Analog inputs and on board UART, SPI and TWI interfaces. In this IOT device, 9 pins of the board are utilized. There are six pins used to interface the character LCD. There

are two pins utilized to interface the ESP8266 Wi-Fi Module and an analog input pin is used to connect the MQ-135 sensor.

2. 16X2 Character LCD

The 16X2 LCD display is used to monitor the sensor values read by the Arduino board from MQ-135. It is interfaced with the Arduino Uno by connecting its data pins D4 to D7 with pins 6 down to 3 of the controller respectively. The RS and E pins of the LCD

are connected to pins 13 and 12 of the controller respectively. The RW pin of the LCD module is connected to the ground.

3. ESP8266 Wi-Fi Module

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application networking functions from another application Each ESP8266 module comes pre-programmed with an AT command. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interfaces, it

contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.

4. MQ-135 ,MQ2, MQ7 Gas sensors

The MQ-135 gas sensor senses the gases like carbon monoxide, ammonia nitrogen, oxygen, alcohols, aromatic compounds, sulfide and smoke. The operating voltage of this gas sensor is from 2.5V to 5.0V. MQ-135 gas sensor can be implementation to detect the smoke, benzene, steam and other harmful gases

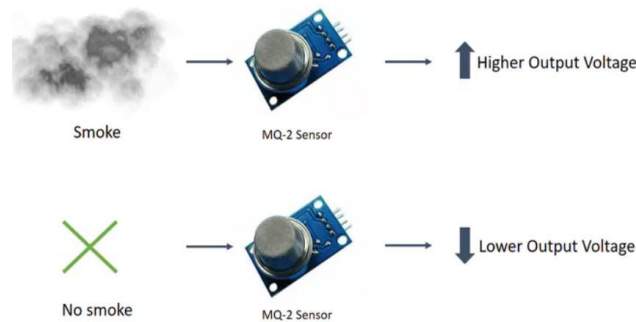


FIG [2]: WORKING MECHANISM OF MQ-135

The voltage that the sensor outputs changes accordingly to the smoke/gas level that exists in the atmosphere. The sensor outputs a voltage that is proportional to the concentration of smoke/gas. In other words, the relationship between voltage and gas concentration is the following:

- 1)The greater the gas concentration,the greaterthe output voltage.
- 2)The lowerthe gas concentration,the lowerthe output voltage.

4. CONCLUSION

In this system, we are providing information about engine health by detecting gases level emitting from vehicle using gas sensors. In this user get notification about engine bad health as gas level. System shows navigation towards destination and also detect rash driving of user by accelerometer sensor and send notification to user which can reduce many accidents.

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