A NEW AUTONOMOUS REAL TIME AIR POLLUTION MONITORING AND PERSON COUNTER IN VEHICLE USING FINGERPRINT SCANNER

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ABSTRACT:

In this project we propose the system which detects the air pollution emitted from the vehicle. In addition, the number of persons travelling in a vehicle is counted by fingerprint scanner and the distance travelled by the vehicle is measured by using speed sensor, thereby reducing the usage of individual vehicles. The whole information has been send to RTO through GSM. And if the driver drunk means the engine automatically stopped by using alcohol sensor. We propose the system to reduce the pollution emission and traffic range.

1.INTRODUCTION:

Most pollutant gases are delivered in Cars,motor cycle, buses, and industrial areas. The principal air-quality pollutant emissions from petrol, diesel, and alternative-fuel engines are carbon monoxide, oxides of nitrogen, un-burnt hydrocarbons and particulate matter. Carbon monoxide, oxides of nitrogen, and un-burnt hydrocarbons are gases, and are generally invisible. In existing system designed with PIC microcontroller that controls the engine of vehicle. Any vehicle exceeds the threshold level of pollution in an area then the engine of the vehicle was automatically switched off by the circuit. Air pollution creates many diseases like cardiovascular disease, asthma, chronic obstructive pulmonary disease, lung cancer, and diabetes. Air pollution kills more people than breast and prostate cancers. The main of the project is, to resolve these kinds of problems. In this project we propose the system which detect the pollution emitted from the vehicle and intimates to the driver through LCD .In addition the number of persons travelling in a vehicle is counted by fingerprint scanner and the distance travelled by the vehicle is measured by using speed sensor, The overall information about the vehicle emitted pollution, number of person travel in the vehicle and distance travelled by the vehicle is sent to RTO unit through GSM technology and it will be stored in RTO unit database.When the RTO realizes that the emitted pollution is above the critical level, he will send the warning SMS to the driver, if the vehicle continuous emitting above the threshold pollution value, RTO send the SMS to the vehicle unit and makes the vehicle to stop. Two types of taxes are implied on the vehicle by RTO, one is based on the pollution emitted by the vehicle, and another based on the number of persons travelled and distance travelled by them. i.e. the tax will be less, if the pollution emitted is less and more number of persons travel for long distances. The tax implied on the vehicle will be intimated to the driver periodically through SMS. If the driver drunk and drive means the vehicle engine automatically stopped by using alcohol sensor.
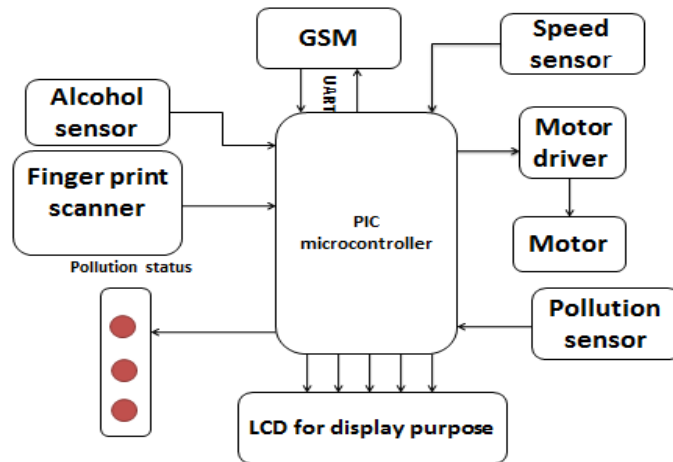
2.PROPOSED SYSTEM:

VEHICLE UNIT:

Fig.1.Block Diagram of Vehicle Unit

The vehicle unit will receive and transmit the message through GSM channel. The pollution levels are sent to the respective driver so that he will control the pollution emission from his vehicle. The public transport is encouraged in the proposed

RTO UNIT:

The RTO unit will display in the PC. Information about the intensity of gas emitted from the vehicle will be stored in RTO PC as well hence he can imply tax on vehicle if it emits more than allowed emission of gasses.   Tax can be implied for the vehicle according to the level of pollution emitted and number of persons travel in the vehicle and distance travelled by the vehicle.
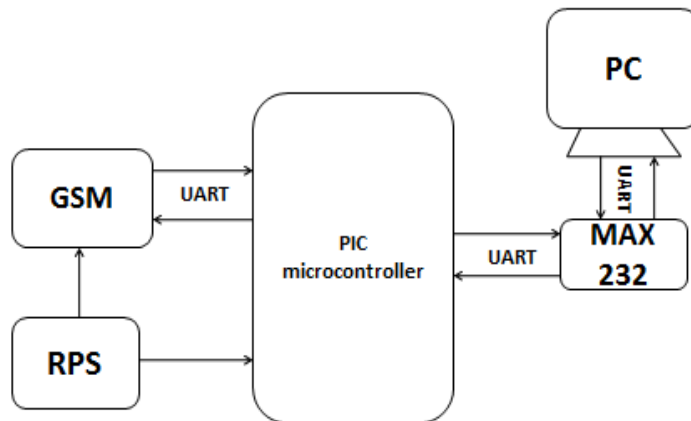
3. HARDWARE IMPLEMENTATION:

A.FINGER PRINT SCANNER:

Fingerprint identification is the method of identification based on the different patterns of human fingers, which is actually unique among each person. It is the most popular way of acquiring details of any person and is the most easy and convenient way of identifying a person. An advantage of fingerprint identification method is that the fingerprints pattern remains same for a person throughout his/her life, making it an infallible method of human identification.

B.ALCOHOL SENSOR:

Sensitive material of MQ-3 gas sensor is $SnO2$, which with lower conductivity in clean air. When the target alcohol gas exists, the sensor's conductivity is higher along with the gas concentration rising. Please use simple electro circuit, Convert change of conductivity to correspond output signal of gas concentration.

MQ-3 gas sensor has high sensity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapor. The sensor could be used to detect alcohol with different concentration; it is with low cost and suitable for different application
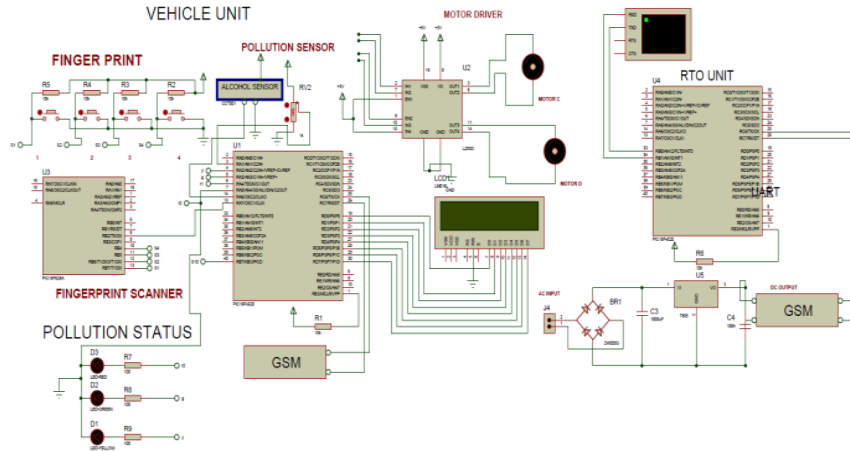
C.CIRCUIT DIAGRAM:

Fig. 3. Circuit diagram of vehicle unit

Fingerprint identification is the method of identification based on the different patterns of human fingers, which is actually unique among each person. It is the most popular way of acquiring details of any person and is the most easy and convenient way of identifying a person. An advantage of fingerprint.

D.POLLUTION SENSOR:

Air pollution sensors are devices that detect and monitor the presence of air pollution in the surrounding area. They can be used for both indoor and outdoor environments. These sensors can be built at home, or bought from certain manufactures. Although there are various types of air pollution sensors, and some are specialized in certain aspects, the majority focuses on five components: ozone, particulate

matter, carbon monoxide, sulfur dioxide, and nitrous oxide. The sensors were very expensive in the past, but with technological advancements these sensors are becoming more affordable and more widespread throughout the population. These sensors can help serve many purposes and help bring attention to environmental issues beyond the scope of the human eye. The EPA maintains a repository of air quality data through the Air Quality System (AQS), where it stores data from over 10,000 monitors in the United States.

E.GSM:

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone.When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities. For the purpose of this document, the term GSM modem is used as a generic term to refer to any modem that supports one or more of the protocols in the GSM evolutionary family, including the 2.5G technologies GPRS and EDGE, as well as the 3G technologies WCDMA, UMTS, HSDPA and HSUPA.A GSM modem exposes an interface that allows applications such as NowSMS to send and receive messages over the modem interface. The mobile operator charges for this message sending and receiving as if it was performed directly on a mobile phone. To perform these tasks, a GSM modem must support an "extended AT command set" for sending/receiving SMS messages.

F.SPEED SENSOR:

This device is a low-cost, high-performance, fully-static infrared encoder/decoder. This device sits between a UART and an infrared (IR) optical transceiver. The data received from a standard UART is encoded (modulated) and output as electrical pulses to the IR Transceiver. The IR Transceiver also receives data which it outputs as electrical pulses. The MCP2120 decodes (demodulates) these electrical pulses and then the data is transmitted by the MCP2120 UART. This modulation and demodulation method is performed in accordance with the IrDA standard. Typically a microcontroller interfaces to the IR encoder/ decoder. Infrared communication is a wireless two-way data connection using infrared light generated by low-cost transceiver signaling technology. This provides reliable communication between two devices.

G. DC MOTOR:

In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel. The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion.
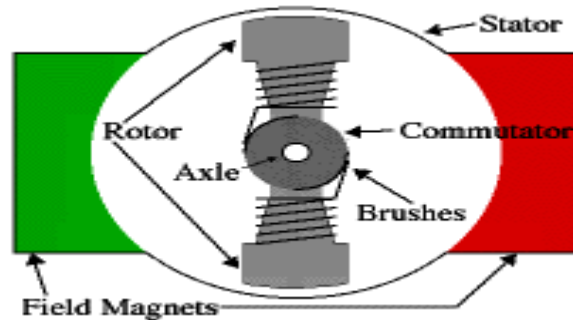
Fig.4. Dc motor

H. L293D (Motor driver):

L293D is a Motor driver integrated circuit which is used to drive DC motors rotating in either direction. It is a 16-pin IC which can control a set of two DC motors simultaneously. The L293D uses 5V for its own power and external power source is needed to drive the motors, which can be up to 36V and draw up to 600mA. L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors.L293D contains two inbuilt H-bridge driver circuits.

I. UART:

A UART (Universal Asynchronous Receiver/Transmitter) is the microchip with Programming that controls a computer's interface to its attached serial devices. Specifically, it provides the computer with the RS-232C Data Terminal Equipment (DTE) interface so that it can "talk" to and exchange data with modems and other serial devices.

J. LCD:

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices andcircuits. These modules are preferred over seven segments and other multi segment LEDs.
The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc.

IV.SIMULATION RESULT:

Person 1 enters into the car:

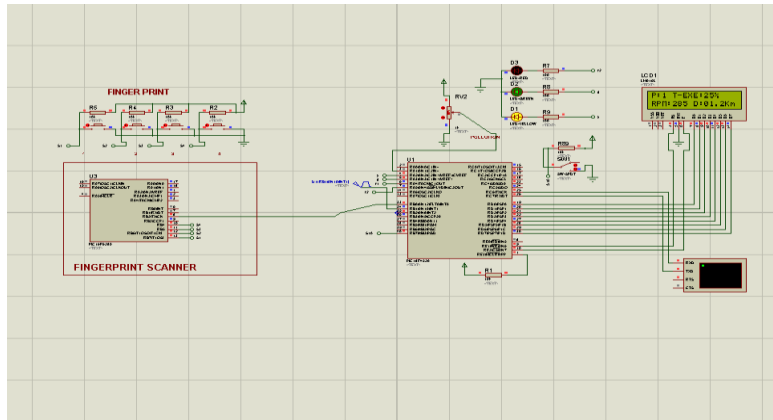Person counter will increased when enters into the carand increase tax for 75%.

Fig.5. Person 1 enters into the car

PERSON 4 ENTERS INTO THE CAR:
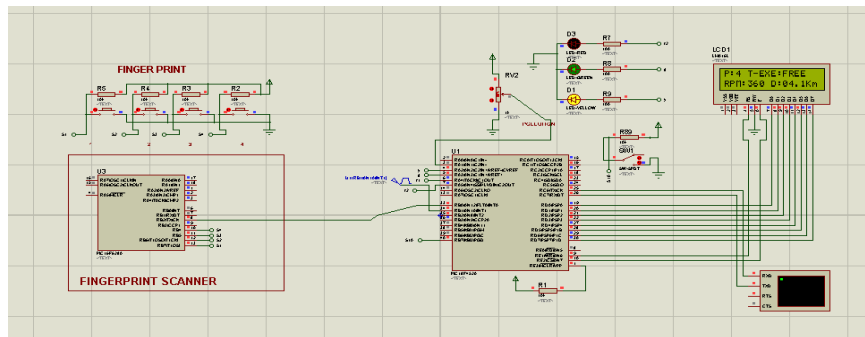
If all 4 person enters into the car the tax will be free

Fig.6. Person 4 enters into the car
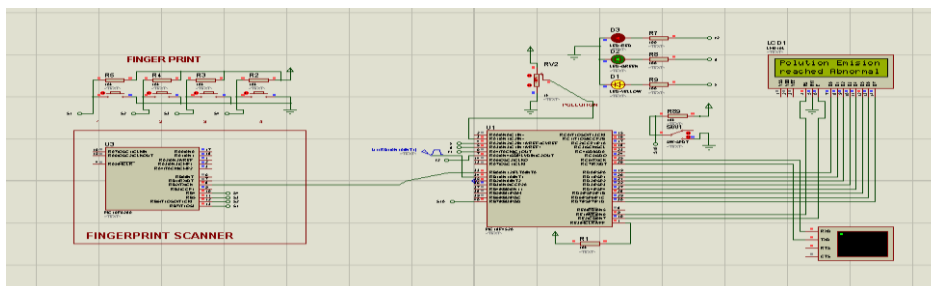
POLLUTION REACHED ABNORMAL:

Fig.7.Pollution reached abnormal

A pollution reached abnormal level three times they have been warned and vehicles have been automatically locked it
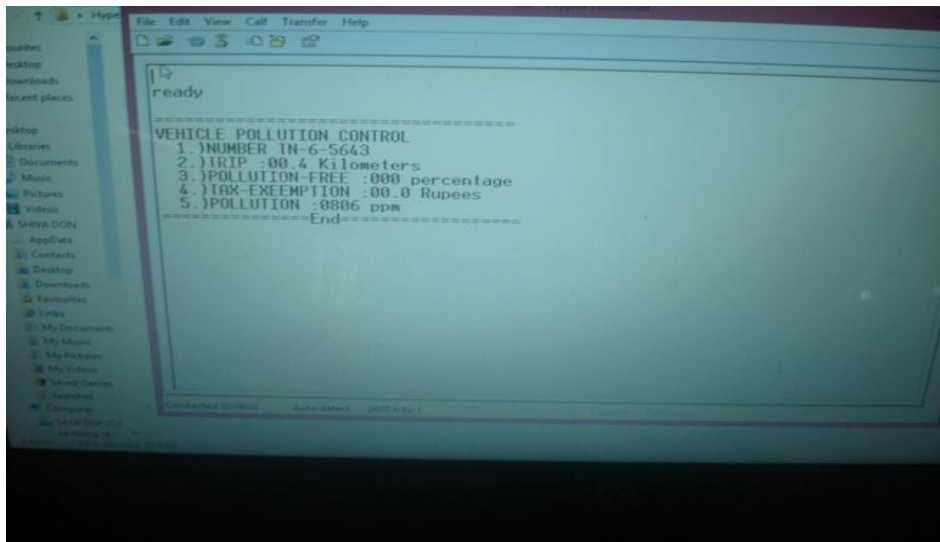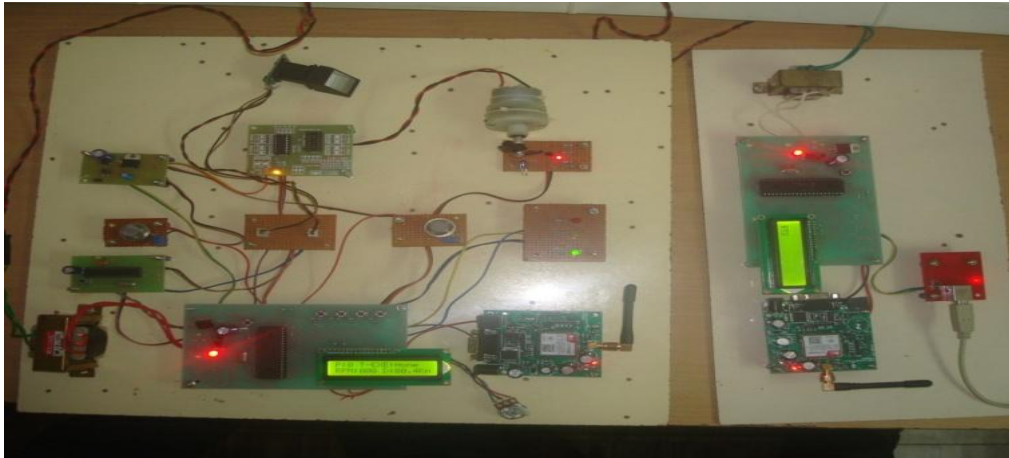
V.HARDWARE RESULT

Fig.8. Communication from RTO Unit to vehicle unit

CONCLUSION:

Today it is widely accepted that human activities are responsible for a high level of pollution and climate change. This system provides a good solution to the complexity of air pollution. Here use of large number of sensor like alcohol, speed, pollution sensor. The overall information about the vehicle emitted pollution, sensor details, number of person travel in the vehicle and distance travelled by the vehicle is sent to RTO unit through GSM technology and it will be stored in RTO unit database. The details get from the RTO database. So RTO will be take require actions.Finally, we would like to develop a detail air quality city by using this system.

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