Car Engine Startup and Brake Oil Monitoring Using Sensors

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ABSTRACT: *The primary concern of "An Automatic Car Engine Startup and Brake Oil Monitoring Using Sensors" is to monitor the level of brake oil and to monitor the exact amount of engine fuel in digital form. It also shows the importance of unimodal biometric in order to identify or to verify a person that wants to start the engine of the car. A fingerprint sensor is placed on the car's door and one in the dashboard to start the engine. If the person's fingerprint matches then he can get into the car and start theengine.*
Key Words : *Sensor, Brake Oil Level, Engine Fuel, Fingerprints, LCD.*

I. INTRODUCTION

The use of unimodal biometric aims to increase the accuracy of the verification or identification of people. There are lots of biometric technologies, like iris, face, fingerprint, hand geometry, and voice recognition etc .Each technology has different advantages and disadvantages, and there are some characteristics that every method has such universality, uniqueness, permanence, collectability, performance, acceptability etc. Some characteristics are better for some technologies at a medium or low level. The project tends to implement biometric security and ignitions system for automobiles. Such a system would serve to eliminate consumer concern pertaining to the safety, Apart from being susceptible to thefts, keys also posses the risk of being misplaced. The project thus aims to establish its credibility by demonstrating the superior reliability and efficiency of a finger prints scan to authorize an individuals. The key focus of the project would be to achieve its targets in a simple, efficient, user-friendly manner whilst providing a model of effectuation that is both practical and commercially feasible for automobile manufacturers. In the recent past, vehicular technology has witnessed quantum leaps; consequently, improvements in performance and features have occurred on a consistent basis. Similarly, the project aims to usher in a new era of heightened vehicular security and consumer compatibility like to enhance existing vehicle security systems with a proposed biometric module, thereby, reducing cases of unauthorized access, to design a stable architecture and system configuration for a feasible implementation of the Biometric module, to develop the module independently and to come out with a 'black-box' that can be easily made compatible with the existing vehicle technology, to design and develop software to manage the proposed system. The project would mark a landmark event in the realm of vehicular technology. It would also initiate a healthy trend in the automobile industry, with a keen focus on enhancedsecurity.
The next generation vehicle necessitates the need for next generation features, and this project intends to provide the same for an ever developing society.

II. RELATED WORK

Several approaches have been proposed for security access control on car using biometrics[1][2][6].In [1],the focus was on a brief overview of the field of biometrics and summarize some of its advantages, disadvantages, strengths, limitations, and related privacy concerns. Gorodnitchy,D.O.,in[2],prepared a framework for designing biometric-enabled access and border control systems changes. The framework incorporates latest innovations and recommendations related to the comprehensive evaluation of biometric systems, including subject-based analysis, calibrated score analysis, and two new performance metrics: threshold-validated recognition ranking and non-confident decisions due to multiple threshold-validated scores. The framework is implemented in the Comprehensive Biometrics Evaluation Toolkit (C-BET) and has been applied for the evaluation of several biometric modalities.C.Lupu and V.Lupu [6] describes the use of multimodal biometrics to access control on an intelligent car. He describes the use and advantages of various biometrics such as fingerprints, iris recognition, hand geometry, voice recognition. In [9] describes the importance of driver ability for both driver and manufacturers. Here metal sensor is used which have an interdigited cube structure. The sensor is located in the vapour dome of the fuel tank and bathed in fuel when the fuel pump is on. It monitors the fuel level rate of decline and measures the fuel volatility. D'Angelo in [10], focuses on the effective integration of display solutions and few sensors for an improved usability and lowering of the system-related driver's distraction, where system consists of a steering wheel with integrated sensors, sensor processing and wireless communication interface and a portable monitoring unit for wireless data

reception, display and interface to the car information system. It helps in monitoring technical solutions like vital signs for patients needing continuous medical care or preventive solutions allowing regular health checks. Wagner, J.R.; Dawson, D.M.; Liu Zeyu[4] proposed a nonlinear model-based control strategy for simultaneous air-to-fuel ratio control and speed tracking in hybrid electric vehicles. It describes the air intake, fuel injection, and rotational dynamics. Idros, uses the embedded matlab function to display the oxidation in lubricant oil. It shows the optical analysis of transmitter variance in lubricant oil due tooxidation[8].

III. METHODOLOGY AND DESIGN

In this system, various sensors are used, such as biometric sensor, level sensor and float sensor. Biometric sensor can be used for various recognition methods like fingerprint, voice, iris etc. But in this system biometric sensor is used only for fingerprint recognization. Fingerprint recognition method is mostly used in personal recognition. It is one of the methods of identification and verification. This method is also used by the police to easily identify the criminals. It can be used especially in the access control applications. Here 2D mathematical models are used to process the fingerprints of an individual. The main technique used for recognition of an individual is generally called AFIS(Automatic Fingerprint Identification System).

Level sensor in this system is used to monitor the exact amount of fuel in the tank. It is used to get the necessary information about current fuel volume in vehicle tank. In this system it is mainly used to define the vechicle fueling volume and also to determine the fuel consumption. Main features of fuel level sensor are:
i.   non-contact, continuous level sensor gauge with no- moving parts.
ii.   compact solution, simple to install, operate andmaintain
iii.   communicates using GSM cellular network, SMS orGPRS
iv.   one size fits all tank shapes anddimensions
v.   open for third party monitoringsoftware
vi.   no field calibration required.
By introducing the fuel level sensor in the system can enable the driver to utilize the fuel in economical way.

Float sensor is also known as level as it is use to show the level of fuel but not in digital form. In the system, this sensor is used to show the level of brake oil. It will show whether the level of the fuel is high or medium or low. Float switches varies from small to large and may be as simple as a mercury switchinside a hinged float or as complex as a series of optical or conductancesensors producing discrete outputs as the liquid reaches many different levels within the tank. The most common type of float switch is simply a float raising a rod that actuates a micro switch.Float sensor is used in the system to check the lubricancy of the brake so that it can prevent from any kind of accidents.
below :

IV. IMPLEMENTATION DETAILS

This system is designed in a prototype hardware board. Architectural diagram of the system is shown
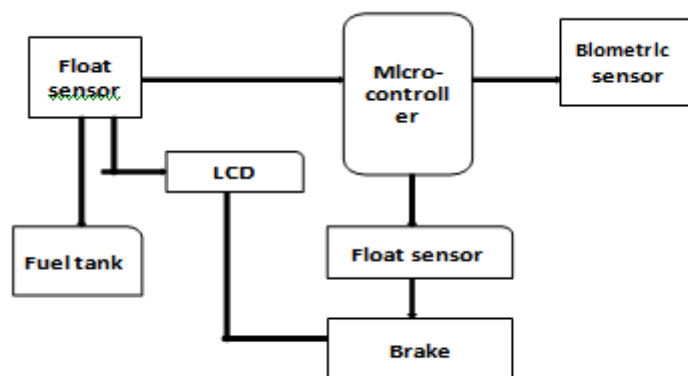

Fig 1: Block diagram of the System

There are two major parts in Implementation: -Hardware part and software part. The hardware circuit consists of arm microcontroller, dc motor, stepper motor, LCD display, fingerprints sensor, fuel level sensor, float sensor, relays, power supply.
At first the hardware is designed on a prototype hardware board, then the code is written and executed

using a software platform. Once the software part is complete, it is interfaced with the arm microcontroller

through serial port. Once the software is interfaced properly with hardware or microcontroller, the microcontroller will accomplish it with the LCD to display. LCDs have become a cheap and easy way to get text displayed for an embedded system. Common displays are set up as 16 to 20 characters by 1 to 4 lines. LCDs donot emit light directly. The input information is supplied as an electrical signal by using the LCD driver.

The stepper motor is used in this system to demonstrate the working of the door setup. The stepper motor uses the theory of operation for magnets to make the motor shaft turn a precise distance when a pulse of electricity is provided. To show its working fingerprint senor is used. The database of the finger of a user is stored in the microcontroller. So when a person will come to open the door, he will first have to go through the fingerprint test, if it matches with the already stored data, then the door will open and the user can go inside.

A dc motor is used to show the working of the engine. Here to start the engine the person will have to go through another fingerprint test, if it matches with the already stored, then the engine is ready to start. Once the engine starts moving it will start displaying the amount of fuel on the LCD at the car dashboard. To display the amount of fuel, a fuel level sensor is fitted in the oil tank. A float sensor is kept in the oil tank to indicate the level of oil in the engine. The level of oil in the engine is visible to the user at the dashboard. An ADC is used to convert the analog signals to digital and display on the display.
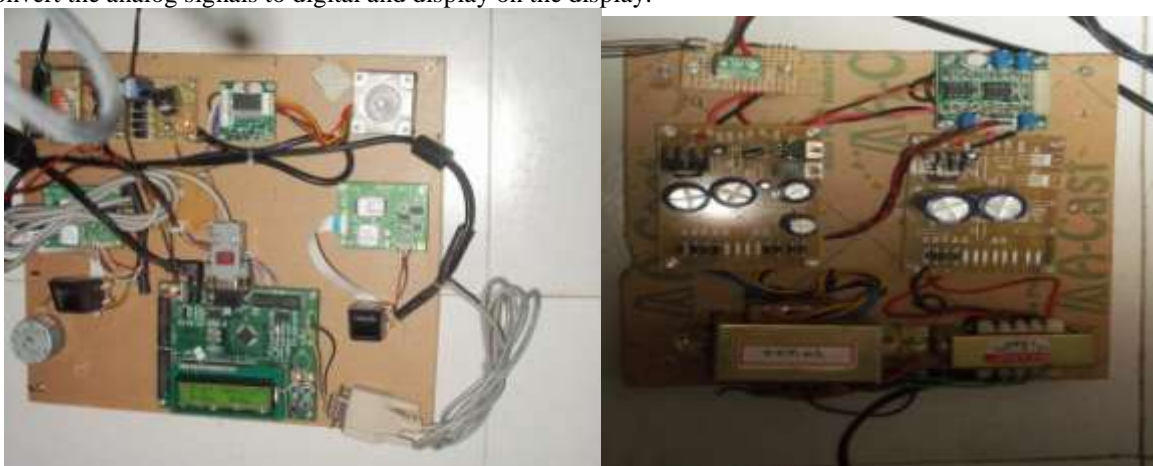

Fig 2 :ControllerDisplay   **Fig 3** : Other HardwareComponents

Power Supply is the device that transfers electric power from a source to a load using electronic circuits. Power supplies are used in many industrial and aerospace applications and also in consumer products. Some of the requirements of power supplies are small size, lightweight, low cost, and high power conversion efficiency. In addition to these, some power supplies require the following: electrical isolation between the source and load, low harmonic distortion for the input and output waveforms, and high power factor (PF) if the source is ac voltage. Some special power supplies require controlled direction of power flow. Typical application of power supplies is to convert utility's AC input power to a regulated voltage(s) required for electronic equipment. Depending on the mode of operation of power semiconductors power supply can be linear orswitching.

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field, which changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches.No electrical connection is required inside the relay between the two circuits, the connection is magnetic and mechanical.

V. CONCLUSION

Thus, this system is designed to provide better security to the user. The system depicts the maintenance of the vehicle. It enables the driver to utilize the fuel in economical way.

Future development can be done by implementing a braking system to the car when the proximity sensor has detected the distance between the car and a object is lesser than the minimum threshold.(30 cm).

A system can be implemented that starts the wiper automatically when it detects the presence of water on the windshield.

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