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System Research and Development for Smart Motor vehicles

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ABSTRACT: *Smart vehicle control systems (SVCS) encompass a wide range of technologies that aid a driver in the driving task by automatically performing control actions (braking, accelerating, or steering) or prompting the driver to perform such actions. Over the last fifteen years, relatively simple systems such as anti-lock braking systems (ABS) and traction control systems have reached production on road vehicles. in the project, we are introduced Automated light and emission control system to enrich passengers and environmental safety. The automated light control system is developed based on the Global Positioning System (GPS) data and Light Dependent Resistor (LDR). The system is good alternate for continuous lighting of head lamp in Bharath-Stage (BS) –IV Vehicles A typical passenger vehicle emits about 4.6 metric tons of carbon dioxide per year. This number can vary based on a vehicle's fuel, fuel economy, and the number of miles driven per year. Failure of vehicle emission control system creates very harmful environmental impacts. Here GPS Data is used to find the particular day and vehicle running place sunset and sunrise time. Based on the sunset and sunrise time, Vehicle headlamp is turned on and off. Further LDR based control system is performing Dim/Bright Control. MQ sensor is used to monitoring the emission level in the vehicle. The overall system is developed and implemented. The performance of the control system is observed as good.*

Keywords: *GPS, Latitude, gas sensor, corbon dioxide, Safety Monitoring.*

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I. INTRODUCTION:

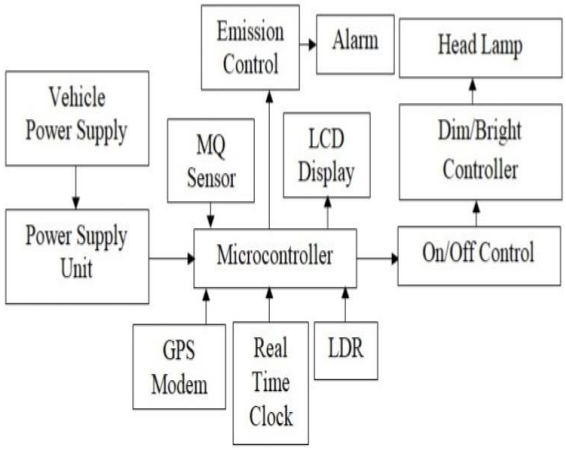
In this paper discussed about the automotive industry moves towards smarter and more efficient vehicles, various technologies are being developed and implemented to improve the overall driving experience. One such technology is the Smart Motor Vehicle System, which integrates various other systems, including the CO2 controlling system, headlight dimming system, and sunrise and sunset systems, to provide a safer, more efficient, and more comfortable driving experience. The CO2 controlling sysstem monitors and reduces the emissions produced by the vehicle for a more sustainable and fuel-efficient journey. The headlight dimming system controls the brightness of the vehicle's headlights to minimize the glare and improve visibility for both the driver and other road users. The sunrise and sunset system uses GPS to determine the location and time of day to predict when the sun will rise or set, ultimately adjusting the vehicle's lighting and window tint to minimize the glare. The implementation of a portable system to determine the location of the sun using a GPS receiver and a Python-programmed sun position algorithm is discussed in this work[1]. The effect is explored in this article along with the related theoretical and experimental findings. Also mentioned is the impact of the observer's height above the local horizon level on observed sunrise and sunset times, as well as the necessary adjustments to the computed times[2].In this paper We may conclude that our study on sunrise and sunset time calculation[3].In this paper This automatically switches the high beam into low beam thus reducing the glare effect by sensing the approaching vehicle and using LDR sensor[4]. In this paper The monitoring of the indoor air quality and the detection of possible leakages of the coolant in CO2 air-conditioning systems[5]. The sensor is based on the well known infrared measurement principle. It includes a new robust infrared gas-detector and a corresponding, newly developed ASIC. First application studies show its suitability for automatic vehicle ventilation systems and for leak detection in R744 air conditioning systems[6].

II. PROPOSED SYSTEM:

To make a vehicle smarter and more efficient, the proposed Smart Motor Vehicle System combines the CO2 controlling system, headlight dimming system, and sunrise and sunset system. By utilising the CO2 controlling system, the system monitors the levels of carbon dioxide emissions produced by the vehicle using sensors, cameras, and GPS data. To lessen glare and increase visibility, the headlight dimming system automatically modifies the lighting of the car based on the direction of oncoming traffic and the driver's position. The Sunrise and Sunset system, meanwhile, uses GPS data to forecast when the sun will rise or set In order to provide real-time updates about traffic conditions, prevent accidents, and ensure a safe and

environmentally responsible journey, motor vehicle systems can communicate with other vehicles and smart traffic systems.

Block Diagram:



Power supply:

Numerous 12V to 5V adapter designs that are already publicly available on the internet use linear regulation, which will dissipate between 15 and 20W at a 2A load at maximum alternator output and thus call for significant heat sinking.

MQ Sensor:

A family of sensors known as MQ gas sensors is used to identify a variety of gases, including alcohol, smoke, methane, LPG, hydrogen, NH3, benzene, and propane. The MQ-135 Gas Sensor can identify harmful gases and smoke, including ammonia (NH3), sulphur (S), benzene (C6H6), and CO2. This sensor, like the others in the MQ series of gas sensors, has a pin for both digital and analogue output. Winsen makes the MQ-2 smoke and combustible gas sensor.

LCD Display:

A flat-panel display known as an LCD, or liquid crystal display, creates images using the characteristics of liquid crystals. Digital watches, calculators, laptop screens, televisions, and other electronic devices that call for high-resolution displays frequently employ LCD displays. A polarising filter, transparent electrodes, a layer of liquid crystals, and a colour filter are among the layers that make up the LCD display

Emission Control:

The amount of harmful gases that vehicles release into the atmosphere is controlled by emission control systems. Carbon monoxide, nitrogen oxides, and hydrocarbons are examples of this. The environment must be protected in order to stop pollution of the air, water, and soil that could be harmful to both human health and the rest of nature. Many emissions include toxic substances like nitrogen oxides, sulphur dioxide, carbon monoxide, and particulates that can lead to cancer, cardiovascular disease, and respiratory issues.

Buzzer:

A buzzer or beeper is a mechanical, electromechanical, or piezoelectric audio signalling device. Buzzers and beepers are frequently used as alarm clocks, timers, train horns, and to confirm user input like a mouse click or keystroke.

Head Lamp:

A headlamp is a lamp that is mounted on the front of a car to light the way. Although headlights and headlamps are frequently used interchangeably, headlight refers to the device itself, while headlamp refers to the light beam that the device emits and disperses.

Dim/Bright Controller:

The LDR sensor circuit, control unit, and headlight with gear rack and pinion setup make up "the automatic head light dim / bright controller and headlight alignment according to steering wheel." The sensor (Light Beam) is used to determine the opposite side vehicle's path.

GPS Modem:

The RS232 interface on the GPS receiver board enables direct communication with embedded or PC-based systems. Our GPS Modem is a full-featured GPS receiver module that includes every functional block, from an antenna input to a serial data output. The GPS Modem can output data in binary or NMEA formats. Under clear skies, GPS-enabled smart phones typically have an accuracy of 4.9 metres (16 feet) or less (view source at ION.org).

LDR:

LDRs, also referred to as photoresistors, are minuscule light-sensing components. An LDR is a resistor whose resistance alters in response to changes in the amount of light hitting it. When light intensity is increased, the LDR's resistance goes down.

Real Time Clock:

An electronic device that counts the passing of time is a real-time clock. RTCs are present in almost every electronic device that needs to maintain accurate time of day, despite the fact that the term is frequently used to refer to the devices in personal computers, servers, and embedded systems.
The frequency of the crystal is typically 32.768 kHz, the same frequency as quartz watches and clocks.

On/Off Control:

The most basic type of feedback control is on-off control. Depending on where the controlled variable is in relation to the setpoint, an on-off controller simply drives the manipulated variable from fully closed to fully open. The temperature control in a home heating system is an illustration of an on-off control.

Microcontroller:

Small computers on a single VLSI integrated circuit chip are known as microcontrollers. One or more CPUs, memory, and programmable input/output peripherals are all included in a microcontroller. With Arduino, you can write and upload computer code to a physical programmable circuit board (often called a microcontroller) using a piece of software called the IDE (Integrated Development Environment), which runs on your computer.

III. Conclusion:

The smart motor vehicle system using CO2 controlling system, headlight dimming system, and sunrise and sunset functionality shows great promise in helping to improve the sustainability and safety of vehicles on the road. The CO2 controlling system helps to reduce the amount of greenhouse gases emitted into the environment, making the vehicle more eco-friendly.The headlight dimming system helps to prevent accidents and save energy by adjusting the brightness of the headlights based on the surrounding conditions.Overall, this smart motor vehicle system has the potential to significantly improve the performance and environmental impact of vehicles, making transportation safer, more efficient, and more sustainable.

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