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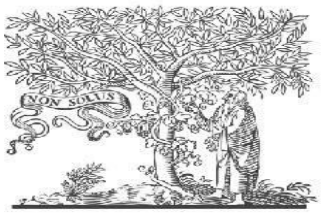

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IOT-BASED VEHICLE THEFT PREVENTION SMOKE AND ALCOHOL DETECTION SYSTEM .

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Abstract: Property crimes are said to hover around 10 million annually. Of this, vehicle theft tops the list and often occurs in all parts of the world. There are so many recent technologies evolving and new methods are being upgraded to overcome this issue. The methods involved in vehicle theft detection have become aware to everyone including the burglars and they try to break the system and steal the vehicle. This paper proposes a system presenting a mechanism to minimize vehicle thefts. The system provides security by sending an alert message as soon the vehicle is stolen or moved without knowledge of owner. System also offers location updates periodically to the registered user through internet of things. This provision for theft vehicle tracking is provided by GPS technology by sending location. GSM technology is used to send an alert message to intimate the owner when the vehicle is started.

The GPS is the acronym for Global positioning system. This GPS receiver is capable of identifying the location in which it was present in the form of latitude and longitudes. The GPS gives the data received from the satellites. For this information the GPS communicates with at least three satellites in the space.

Index Terms: Vehicle theft ,Technologies ,Theft detection ,Alert message ,Internet of things ,GPS technology ,GSM technology ,Latitude and longitudes ,Satellites

1. INTRODUCTION

In recent years the vehicle stealing has been thought of as a big problem. The protection of the vehicle is needed. There are also some limitations and some of the more expensive ones. Therefore, an effective security vehicle is required. This project detects about the vehicle theft. The arduino interface is an integral a section of dc motor and GPS. Wireless fidelity module is used to search out the vehicle's location through the Global Positioning System (GPS). GPS may be a navigation system that will be accustomed track the vehicle, and it provides the placement of the consumptive device altogether weather conditions. Victimization the GPS antenna provides the latitude and meridian of the device. When we leave the vehicles outside, currently if the vehicle is taken, the

D.C. motor starts and therefore the method on top of is over and also the info is distributed through the web content. This vehicle is employed as a vehicle thievery and rescue tool for thievery hindrance and following system. The use of vehicles in today's time is obligatory. At identical time, vehicle steal day is that the quickest growing day in magnitude relation. As a result, vehicles protection from theft is very important. Prevention of cars is often done by providing authorization for owners and by building anti-theft system in vehicles**.**

An Embedded System is a combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a specific function. A good example is the microwave oven. Almost every household has one, and tens of millions of them are used every day, but very few people realize that a processor and software are involved in the preparation of their lunch or dinner. This is in direct contrast to the personal computer in the family room. It too is comprised of computer hardware and software and mechanical components (disk drives, for example). However, a personal computer is not designed to perform a specific function rather; it is able to do many different things. Many people use the term general-purpose computer to make this distinction clear. As shipped, a general-purpose computer is a blank slate; the manufacturer does not know what the customer will do wish it. One customer may use it for a network file server another may use it exclusively for playing games, and a third may use it to write the next great American novel. Frequently, an embedded system is a component within some larger system. For example, modern cars and trucks contain many embedded systems. One embedded system controls the anti-lock brakes, other monitors and controls the vehicle's emissions, and a third displays information on the dashboard. In some cases, these embedded systems are connected by some sort of a communication network, but that is certainly not a requirement. At the possible risk of confusing you, it is important to point out that a general-purpose computer is itself made up of numerous embedded systems. For example, my computer consists of a keyboard, mouse, video card, modem, hard drive, floppy drive, and sound card-each of Which is an embedded system? Each of these devices contains a processor and software and is designed to perform a specific function. For example, the modem is designed to send and receive digital data over analog telephone line. That's it and all of the other devices can be summarized in a single sentence as well. If an embedded system is designed well, the existence of the processor and software could be completely unnoticed by the user of the device. Such is the case for a microwave oven, VCR, or alarm clock. In some cases, it would even be possible to build an equivalent device that does not contain the processor and software. This could be done by replacing the combination with a custom integrated circuit that performs the same functions in hardware. However, a lot of flexibility is lost when a design is hard-cooled in this way. It is mush easier, and cheaper, to change a few lines of software than to redesign a piece of custom hardware.

2. LITERATURE REVIEW

The program that are advanced in terms of some electronic and person present additives can be independently carried out despite the fact that there are some drawbacks and disadvantages for its existing standards of necessities. More precisely the quantity in these form of standalone applications were fashioned together to state them as embedded system packages. Embedded gadgets is automated with a committed functionality in which massive electrical, electronic and mechanical structures are inserted in conjunction with their constraints of execution. An software in embedded machine acquires precise traits of the system which are not useful.

As the number of accidents are increasing day by day continuous tracking of the causes for the accidents is necessary. The root cause is identification of drunkness , drowsiness of driver and irrelevant behaviour of the vehicle. Some systems are proposed in this regard . In this paper our main focus is to provide solution to the above issues with certain characteristics, with continuous monitoring of alcohol consumption.

In past there were some technologies which protects the automobile from drunken driver. Those technologies are works on the concept of GSM and GPS. In this system, the microcontroller was interconnected with the car alarm system and alerts the owner on his mobile phone. The tracking system is composed of a GPS receiver, PIC micro controller processes this information and this processed information is sent to the user/owner using GSM modem by Abhishek guptha[1] .

In [2], they used PIC 16876A micro controller, alcohol sensor, alarm, LCD display. Ignition system will be off when alcohol detected.

In [3], GSM, GPS system were used to find the location and alert message to the owner. Location would be in longitude and latitude which was difficult to locate. Ignition system turns off when the sensor senses the alcohol.

In [4], IR LED894 was used , it was produces high intensity IR rays which absorbs high content of alcohol from air , so this system will work only when driver drunk high concentration alcohol.

In [5], IR SENSOR was used to detect obstacle that comes in front of sensor, then the vehicle stops. It also senses the toxic gases like LPG, CO2, and alcohol from inside of the automobile. If there is high content of gasses then SMS has been sent to owner to notify him.

In [6], it proclaims a real time prototype. It has used remotely located charge-coupled-device cameras which are equipped with infrared illuminators to get images of the driver. This gives clues of gaze movement, eye lid movement, and facial expressions. It tells eye blink frequency is beyond the normal state, and then ignition system offs immediately. In our present project we replaced GPS/GSM system by the technology of IOT (INTERNET OF THINGS)

3. METHODOLOGY

Advantages

- Enhanced vehicle security: The proposed vehicle theft prevention and safety system provides advanced security features such as real-time alert messages, automatic engine shut-off, and GPS tracking, which significantly reduce the risk of vehicle theft.

- Improved passenger safety: The system can detect smoke and alcohol levels, which can prevent potential accidents and protect passengers from harm.

- Integration with advanced technology: The system is integrated with advanced technology such as GPS, IoT, and video streaming, offering real-time location updates and data transfer capabilities.

- Customizable features: The system's features can be customized to suit the user's needs, including the level of sensitivity for detecting unauthorized movement, smoke, and alcohol.

Disadvantages

Dependence on technology: The system's reliance on technology such as GPS and IoT can make it vulnerable to system failures, signal disruptions, and hacking attempts.

Applications

- Personal vehicles: The system can be installed in personal vehicles to prevent theft and improve passenger safety, providing peace of mind to car owners.

- Commercial fleets: The system can be optimized for use in commercial fleets to monitor driver behavior, prevent theft, and improve safety, potentially saving costs associated with accidents and vehicle theft.

- Rental car companies: The system can be used by rental car companies to track their vehicles, prevent theft, and ensure customer safety.

- Law enforcement: The system can be used by law enforcement agencies to track and recover stolen vehicles, potentially reducing the number of vehicle thefts.

- Insurance companies: Insurance companies can use the system to offer discounts to car owners who install the system, as it can potentially reduce the number of theft-related insurance claims.

Components Used

- Arduino
- Switch
- Smoke Sensor
- Alcohol Sensor
- GPS
- LCD
- Buzzer
- Wi-Fi

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- Led Red
- Green Led
- Ignation Fan

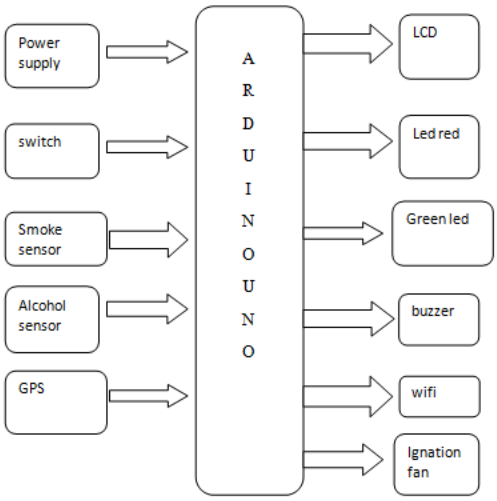

Fig 1 Block diagram For Proposed System

Arduino: The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

LCD: Liquid Crystal Display also called as LCD is very helpful in providing user interface as well as for debugging purpose. The most commonly used Character based LCDs are based on Hitachi's HD44780 controller or other which are compatible with HD44580. The most commonly used LCDs found in the market today are 1 Line, 2 Line or 4 Line LCDs which have only 1 controller and support at most of 80 characters, whereas LCDs supporting more than 80 characters make use of 2 HD44780 controllers.

Gas Sensor: The MQ series of gas sensors utilizes a small heater inside with an electro chemical sensor these sensors are sensitive to a range of gasses are used at room temperature. MQ135 alcohol sensor is a Sno2 with a lower conductivity of clean air. When the target explosive gas exists, then the sensor's conductivity increases more increasing more along with the gas concentration rising levels. By using simple electronic circuits, it convert the charge of conductivity to correspond output signal of gas concentration

The MQ135 gas sensor has high sensitivity in ammonia, sulfide, benze steam, smoke and in other harm full gas. It is low cost and suitable for different applications. There are different types of alcohol sensors like MQ-2, MQ-3, MQ-4, MQ-5, MQ-6, etc.

GPS: GPS stands for Global Positioning System by which anyone can always obtain the position information anywhere in the world. A number of GPS satellites are deployed on six orbits around the earth at the altitude of approximately 20,000 km (four GPS satellites per one orbit), and move around the earth at 12-hour-intervals.

Wi-Fi: A wireless network uses radio waves, just like cell phones, televisions and radios do. In fact,

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communication across a wireless network is a lot like two-way radio communication.

Here's what happens:

A computer's wireless adapter translates data into a radio signal and transmits it using an antenna.

Buzzer: A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or key stroke. Buzzer is an integrated structure of electronic transducers, DC power supply, widely used in computers, printers, copiers, alarms, electronic toys, automotive electronic equipment, telephones, timers and other electronic products for sound devices. Active buzzer 5V Rated power can be directly connected to a continuous sound, this section dedicated sensor expansion module and the board in combination, can complete a simple circuit design, to "plug and play."

Switch: a switch is an electrical component that can disconnect or connect the conducting path in an electrical circuit, interrupting the electric current or diverting it from one conductor to another.[1][2] The most common type of switch is an electromechanical device consisting of one or more sets of movable electrical contacts connected to external circuits. When a pair of contacts is touching current can pass between them, while when the contacts are separated no current can flow.

GSM: GSM is a mobile communication modem; it is stands for global system for mobile communication (GSM). The idea of GSM was developed at Bell Laboratories in 1970. It is widely used mobile communication system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands.

LED: Wires is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor.[5] White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.

4. IMPLEMENTATION

The item for the proposed system is executed utilizing the Arduino IDE.

Integrated Development Environment (IDE) for Arduino: A substance chief for composing code, a message region, a message terminal, a toolbar with buttons for normal undertakings, and a progression of menus are totally expected for the Arduino IDE. It talks with the Arduino equipment and sends dares to it.

File

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New creates a new supervisor instance with all of the essential features of the drawing present.

allows you to browse the envelopes and papers on your PC to create a sketch record.

At the point when you open Later, a rundown of the latest drawings that might be gotten to is shown.

Within the envelope structure of Sketchbook, the corresponding representation is displayed in a different proofreading case whenever any name is mentioned.

Models All models provided by the Arduino Programming (IDE) or library are displayed when this menu option is selected. The models are arranged in a tree, making it simple to search by library or subject.

closes the Arduino Programming instance clicked.

Save The current name is used to save the artwork. A name will be proposed for the record in a "Save as..." exchange on the off chance that it has not as of now been named.

You can save the current drawing under a different name by selecting "Save as..."

It shows the printing-explicit Page Setting window.

In accordance with the Page Arrangement limits, Print sends the ongoing drawing to the printer.

By clicking Inclinations, you can change many IDE settings, like the language of the IDE interface.

All IDE windows are closed by Stop. The next time you start the IDE, the open drawings that were open when Stopped was selected will be restored immediately.

Edit

- Record at least one stage of modification as a fix or retry; You can use retry again when you come back.
- Cut The chose text is replicated to the clipboard and eliminated from the editor.
- After reproducing the text from the proofreader, duplicate copies the selected text and copies it to the clipboard.
- Copy the code for your sketch to the clipboard in a format that is suitable for presenting on the discussion with punctuation shading. Duplicate for Collection
- Duplicate as HTML recovers the code from your sketch and copies it to the clipboard as HTML, ready for use on websites.
- Glue the contents of the clipboard into the supervisor by copying them there from the clipboard.
- The entire selection made by the manager is included in Select All.

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- Remark/Uncomment Inserts the /remark tag at the beginning of each line or removes it altogether.

- Indent adds or subtracts a space at the beginning of each selected line, moving the text one space to the side or removing a space.

- When you click "Find," the "Find and Supplement" window opens. Here, you can use a few models to figure out the text you need to look for in the ongoing plan.

- Depending on where the cursor is, Find Next will highlight the following event, if any, of the string that was entered in the Find window as the pursuit object.

- Based on where the cursor is, Find Earlier highlights the preceding event of the string in the Track down window.

Sketch

Verify or arrange your drawing after checking for errors while it was being made. In the control center section, it will show the factors and the amount of memory used by your code.

Transfer stacks the parallel record onto the designated board via the predefined Port after aggregation.

Using a software engineer to transfer This will replace the board's bootloader; Go to Devices > Consume Bootloader to reactivate the option to transfer to the USB sequential port. Nevertheless, it enables you to make use of the entire Blaze RAM for your artwork. Keep in mind that following this advice will not result in the wires lighting up, assuming it isn't too much work. Navigate to Apparatuses > Consume Bootloader to accomplish this.

Send Out Completed Double produces a.hex file that can be filed or sent to the board using a variety of tools.

In the ongoing representation organizer, open the Presentation the Sketch Envelope order.

Add a library to your drawing by using the #include instruction at the beginning of your code. For more details, see the libraries listed below. From this menu item, you can also import new libraries from.zip files and launch the Library Director.

A new document is added to the drawing using Embed Document... it will be duplicated from its current location). As is customary for assets like documentation, the record is saved in the sketch's data subfolder. The sketch programming excludes the objects in the information envelope because they have not been gathered.

Tools

Your code is precisely arranged by Auto Arrangement by indenting it so that the declarations contained within the wavy supports are also

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indented and the opening and closing wavy supports line up.

The current drawing is saved as a.zip file using Document Sketch. The chronicle and the artwork are kept in the same envelope.

Reload the page and resolve the encoding issue. The proofreader's single map encoding and the roast guides of other functioning frameworks are unaffected by this.

Screen for Successive beginnings the information exchange with any connected board on the at present chosen Port and opens the comparing screen window. On the off chance that the board upholds it, this for the most part resets it. Perform a reset to prevent the sequential port from opening.

Board Select your preferred board. The various sheets are depicted in the following image.

All of your PC's real and simulated sequential devices are stored in this menu. You should feel immediately energized as soon as you enter the high level gadgets menu.

Software developer: Programming a board or chip without using the USB-sequential connection that is already installed is done with a hardware developer. In any case, if you want to modify a brand-new microcontroller, you will require this.

Consume Bootloader You can embed a bootloader into the microcontroller of an Arduino board by utilizing the options in this menu. This is useful if you buy a different ATmega microcontroller, which sometimes doesn't have a bootloader, but it doesn't affect how the Arduino board works on its own. Make sure that the appropriate board has been selected from the Sheets selection before eating the bootloader on the goal board. The necessary wiring was also installed as a result of this direction.

5. RESULTS AND DISCUSSION

The system's effectiveness in preventing vehicle theft and improving safety was tested through various experiments and simulations. In a simulated vehicle theft scenario, the system was able to detect the unauthorized movement of the vehicle and send an immediate alert message to the registered user with the vehicle's location. The engine was also turned off, preventing the thief from driving the vehicle any further.

Fig 2 Circuit Figure

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In another simulation, the smoke detector was tested by generating smoke in the car's cabin. The detector quickly detected the presence of smoke and triggered the automatic engine shutdown mechanism, preventing any hazardous situations from arising. The alcohol detector was also tested by simulating drunk driving. The system was able to accurately detect the presence of alcohol and shut down the engine, preventing any potential accidents caused by impaired driving.

Real-world testing of the system was also conducted, and the results were promising. The system was able to accurately detect unauthorized movement, smoke, and alcohol levels in the vehicle. The registered user received timely alert messages with the vehicle's location, allowing for prompt action to be taken. The engine was also turned off in hazardous situations, thereby preventing potential accidents.

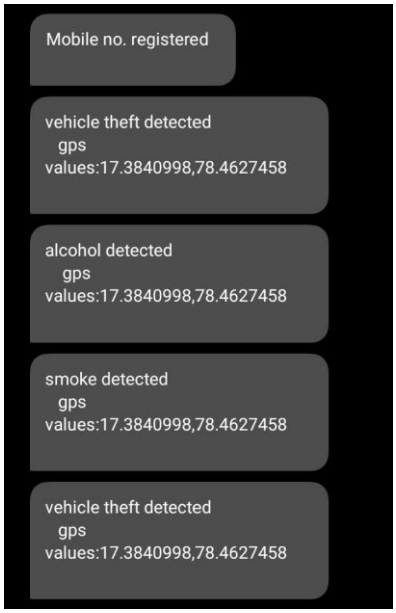

Fig 3 Output Figure

In conclusion, the system's ability to detect and prevent vehicle theft, as well as improve safety, was demonstrated through various experiments and simulations. The system's accurate detection of hazardous situations and timely alert messages to the registered user can help prevent potential accidents and save lives. Overall, the system is a promising solution to the growing problem of vehicle theft and can significantly improve passenger safety.

6. CONCLUSION

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

7. FUTURE SCOPE

The proposed vehicle theft prevention and safety system using GSM, GPS, and WiFi modules has significant potential for future development and expansion. Some of the future scope of the system are:

- Integration with smart home systems: The system can be integrated with smart home systems to provide more advanced security features such as automatic door locking and unlocking, remote vehicle access, and voice control.

- Video streaming: The system can be further improved by incorporating a camera for live video streaming, allowing the registered user to

have real-time visual access to the vehicle's interior.

- Driver monitoring: The system can be optimized for monitoring driver behavior and detecting fatigue, distraction, or reckless driving. This feature can be particularly useful for commercial fleets to monitor driver performance and prevent accidents.

- Advanced analytics: The system can be integrated with advanced analytics tools to analyze the data collected from various sensors and provide insights into the vehicle's performance, driver behavior, and potential security risks.

- Global expansion: The system can be expanded globally to provide a comprehensive vehicle theft prevention and safety solution for car owners around the world.

In conclusion, the proposed system has vast potential for future development and expansion, offering a comprehensive solution for vehicle theft prevention and passenger safety. The integration of advanced technologies such as IoT, GPS, and video streaming can enhance the system's capabilities and provide more value to the users.

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