RASPBERRY PI BASED SMART CAR SECURITY FOR THEFT CONTROL AND ACCIDENT NOTIICATION

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ABSTRACT: A raspberry pi based smart car security for theft control and accident notification as a part of smart city development. The RFID tag is placed in a vehicle. The RFID tags are used to get the data from RFID cards. For programming the RFID tags, the RFID tag writer is used. By reading the numbers in the RFID cards. Vehicle identification can be easily done. (getting the owner details). The finger print module is placed in car door. Whenever the finger is matched with finger print module the door was automatically ON, otherwise it will give the buzzer alert. GPS and GSM Modules are used for accident detection. Whenever the accident occurs, this system automatically sends the SMS to the particular person using GPS and GSM Module. This system also has the alcohol sensor which detect whether the person consumed alcohol or not. If he consumed the alcohol means the motor will be turned off automatically.

KEYWORDS: Radio Frequency identification (RFID), Global Positioning System (GPS), Vehicle identification, Alcohol, Global System for Mobile Communications (GSM).

INTRODUCTION: The ability to accurately detect a vehicle‟s location and its status is the main goal of automobile trajectory monitoring systems.& also The high demand of automobiles has also increased the traffic hazards and the road accidents. This is because of the lack of best emergency facilities available in our country This design is a system which can detect accidents in significantly less time and sends the basic information to first aid center within a few seconds covering geographical coordinates, the time and angle in which a vehicle accident had occurred. This alert message is sent to the rescue team in a short time, which will help in saving the valuable lives. These systems are implemented using several hybrid techniques that include: wireless communication, geographical positioning and embedded applications. The vehicle tracking systems are designed to assist corporations with large number of automobiles and several usage purposes. A Fleet management system can minimize the cost and effort of employees to finish road assignments within a minimal time. Besides, assignments can be scheduled in advanced based on current automobiles location. Therefore, central fleet management is essential to large enterprises to meet the varying requirements of customers and to improve the productivity [1]. So taking in action all these things we are going to design and develop a machine, which will track the real time location of the vehicle using blue tooth technology with the help of an android base mobile phones. The ability to accurately detect a vehicle‟s location and its status is the main goal of automobile trajectory monitoring systems. These systems are implemented using several hybrid techniques that include: wireless communication, geographical positioning and embedded applications. The vehicle tracking systems are designed to assist corporations with large number of automobiles and several usage purposes. This system can minimize the cost and effort of employees to finish road assignments within a minimal time. So taking in action all these things we are going to design and

develop a machine, which will track the real time location of the vehicle using blue tooth technology with the help of an android base mobile phones. The main goals of this project is to design and develop an economical model, which requires less power with less complex in structure, easy to implement. An additional setting could be implemented to interface the system to the car"s alarm to alert the owner on his cell phone if the alarm is set off. The automobile"s airbag system can also be wired to this system to report severe accidents to immediately alert the police and ambulance service with the location of the accident.

LITERATURE SURVEY

S. J. Swathi, Shubham Raj, D. Devaraj "Microcontroller and Sensor Based Smart Biking System for Driver's Safety", 2019 IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS): This paper describes the proposed methodology to build a safety system which is integrated with the smart helmet and intelligent bike to reduce the probability of two-wheeler accidents, bike theft and drunk drive cases. This device aims for the safety and security of two-wheeler riders as well as of two wheelers. In this era, more than 1.5 lakhs people were injured because of road accidents. It is noted that 17 deaths happen for every one hour. The major reason is drunken drive. It is reported that the majority of road accidents are happened only because of drunken drive. It has also been observed that other accidents are because of improper usage of helmet. This system is used to reduce the rate of accident and rate of vehicle theft. This proposed methodology is implemented using RFID technology, password authentication and sensors namely gas sensor and proximity sensor. In this proposed methodology proximity sensor is fixed in the helmet so that the rider cannot ride the two-wheeler if he/she doesn't wear the helmet. Gas Sensor is fixed so as to sense whether the rider has consumed the alcohol. If so, the ignition system doesn't get on. The ignition system gets on and the gas sensor checks whether the rider had consumed alcohol or not, if yes, it will be detected by the gas sensor and the ignition system gets off automatically. The bike will start until the rider wears the helmet and if there is no alcoholic content present. When the rider needs to start the vehicle, he/she need to use the password provided to start the vehicle in order to authenticate the owner of the vehicle. Abu Taher Noman, Samzad Hossain, Shariful Islam, Mohammad Emdadul Islam, Nawsher Ahmed, M A Mahmud Chowdhury "Design and Implementation of Microcontroller Based Anti-Theft Vehicle Security System using GPS, GSM and RFID" 2018 4th International Conference on Electrical Engineering and Information & Communication Technology (iCEEiCT): Stealing the vehicle is the major threat to car or vehicle owners. Nowadays, it is increasing day by day. If not recovered soon, stolen vehicle is generally sold, revamped or even burned, if the resale price is considered to be too low. When a vehicle is stolen, it becomes hard to locate and track it, which considerably decreases the chances of recovering it. An Anti-Theft vehicle security has been developed to mitigate this problem. This system consists of a PIC16F876A microcontroller, fingerprint, RFID, GPS-GSM modules and a tilt sensor. The car will be started with RFID or fingerprint or password. If an unauthorized person wants to open the door of the vehicle, it will ask for correct RFID or password or fingerprint. The tilt sensor is used to measure any breaking of windows or doors and movement of the vehicle, a message will be sent to the owner's mobile containing the location of the car via GPS-GSM module. The system gives also an alarm. Furthermore, the connection to the fuel injector of

the car is deactivated to prevent the unauthorized start of the vehicle anyhow. This anti-theft security system enhances the chances of recovering the car. Zhigang Liu, Anqi Zhang, Shaojun Li "Vehicle anti-theft tracking system based on Internet of things", Proceedings of 2013 IEEE International Conference on Vehicular Electronics and Safety.   As the amount of urban vehicle grows rapidly, vehicle theft has become a shared concern for all citizens. However, present anti-theft systems lack the tracking and monitoring function. The vehicle anti-theft tracking system based on Internet of things is designed in this article, which can provide all-round active service for the owners. This system is controlled by an RFID module to switch on and off. When the car is stolen, the vibration sensors and pyroelectric infrared sensors mounted inside the vehicle are triggered, and GSM module will send the location information obtained by GPS module to the owner's mobile phone, thus owners can check the position of the vehicle with an android software developed by our team. This system uses android mobile phones as mobile terminal, which is more convenient and flexible than other kinds of like products since the owner can check and track the position of the car immediately with android mobile phone application once the car is stolen.

PROPOSED ARCHITECTURE:
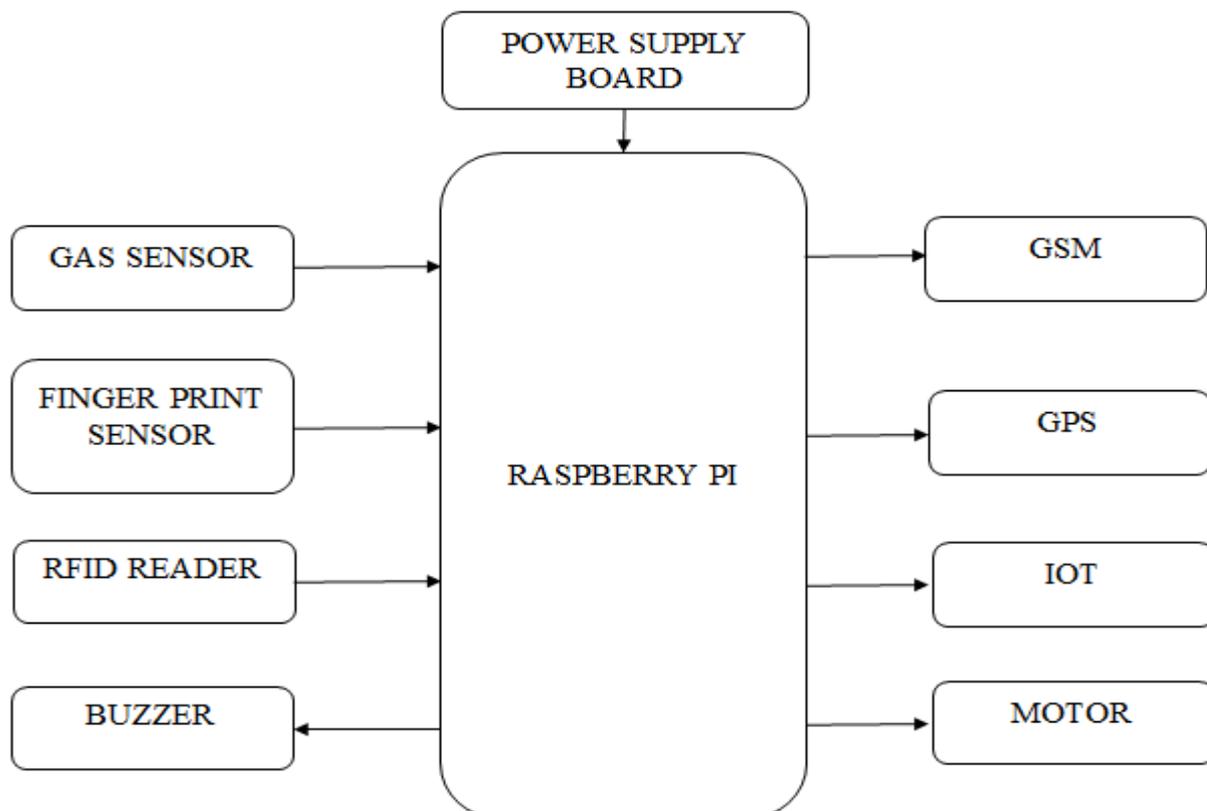
Fig: Proposed Block diagram

The GPS-GSM based tracking device can be controlled through the use of text messages. When messages are sent to the system, it responds by sending back tth coordinates provided the keywords match. Two keywords were used for the operation of the system which are 'ON' and 'OFF' When the user sends a text message with 'ON' as the message body the system is designed to send the coordinates back to the programmed users number. When the user sends a text message with 'OFF' in the message body, this signifies that the vehicle has been stolen and a message is sent to a programmed local authority's number to induce quick action. The coordinates of the vehicle will be sent back to the programmed number regardless of the number through which the message is sent provided that the keywords match either 'ON' or 'OFF'

RASPBERRY PI: The raspberry pi is a single chip computer developed by raspberry pi foundation to advance education in schools and developing nations. The unique model became undeniably more famous than foreseen, selling outside its target market for uses such as robotics. It does exclude peripherals (such as keyboards and mice) and cases. Nonetheless, a few frills have been incorporated in a few official and informal groups. The association behind the Raspberry Pi comprises of two arms. The initial two models were created by the Raspberry Pi Foundation. After the Pi Model B was delivered, the Foundation set up Raspberry Pi Trading, with Eben Upton as CEO, to build up the third model, the B+. Raspberry Pi Trading is liable for building up the innovation while the Foundation is an instructive cause to advance the educating of essential software engineering in schools and in creating nations. The Broadcom BCM2835 SoC utilized in the original Raspberry Pi incorporates a 700 MHz ARM11 76JZF-S processor, Video Core IV designs preparing unit (GPU), and RAM. It has a level 1 store of 16 KB and a level 2 (L2) store of 128 KB. The level 2 store is utilized fundamentally by the GPU. The SoC is stacked underneath the RAM chip, so just its edge is noticeable. The 1176JZ(F)- S is a similar CPU utilized in the first iPhone, in spite of the fact that at a higher clock rate, and mated with a lot quicker GPU.

Fig:Raspberry pi diagram

NODEMCU (ESP8266): NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and equipment which depends on the ESP-12 module. The term "NodeMCU" naturally alludes to the firmware instead of the advancement units. The firmware utilizes

the Lua scripting language. It depends on the eLua venture, and based on the Espressif Non-OS SDK for ESP8266. It utilizes many open source ventures, for example, lua-cjso and SPIFFS.
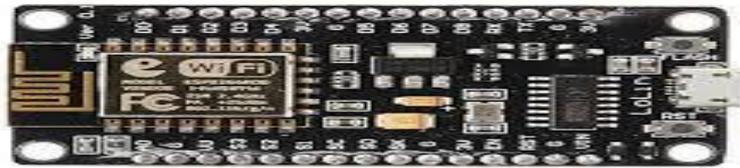
Fig NODEMCU diagram

The NodeMCU (Node MicroController Unit) is an open source programming and equipment improvement climate that is worked around an exceptionally reasonable System-on-a-Chip (SoC) called the ESP8266. The ESP8266, planned and made by Espressif Systems, contains all pivotal components of the cutting-edge PC: CPU, RAM, organizing (wifi), and even a modern operating framework and SDK. When bought at mass, the ESP8266 chip costs just $2 USD a piece. That settles on it a magnificent decision for IoT tasks, all things considered. Nonetheless, as a chip, the ESP8266 is additionally difficult to access and utilize. You need to weld wires, with the fitting simple voltage, to its PINs for the least complex assignments, for example, fueling it on or sending a keystroke to the "PC" on the chip. What's more, you need to program it in low-level machine guidelines that can be deciphered by the chip equipment. While this degree of coordination isn't an issue when the ESP8266 is utilized as an installed regulator chip in mass-delivered hardware, it is a colossal weight for specialists, programmers, or understudies who need to explore different avenues regarding it in their own IoT ventures.

GSM MODULE: GSM (Global System for Mobile correspondence) is a digital mobile network that is generally utilized by cell phone clients in Europe and different pieces of the world. GSM utilizes a variety of time division numerous entrance (TDMA) and is the most broadly utilized of the three digital wireless telephony advancements: TDMA, GSM and code-division various access (CDMA).

Fig. GSM module image

GSM, along with different innovations, is important for the advancement of remote versatile broadcast communications that incorporates High-Speed Circuit-Switched Data (HSCSD), General Packet Radio Service (GPRS), Enhanced Data GSM Environment (EDGE) and Universal Mobile Telecommunications Service (UMTS). The GSM network has four separate parts that cooperate to work overall: the cell phone itself, the base station subsystem (BSS), the organization exchanging subsystem (NSS) and the activity and backing subsystem (OSS). The cell phone interfaces with the organization by means of equipment. The endorser personality module (SIM) card furnishes the organization with recognizing data about the portable client.

GPS MODULE: Represents Global Positioning System. GPS is a satellite-based framework used to decides the exact position of an item in the ground. GPS innovation was first utilized by the United States military during the 1960s and ventured into nonmilitary personnel use throughout the following barely any many years. Today, GPS collectors are remembered for some business items, for example, automobiles, smartphones, practice watches, and GIS gadgets. The GPS framework incorporates 24 satellites conveyed in space around 12,000 miles (19,300 kilometers) over the earth's surface. They circle the earth when at regular intervals at an amazingly quick movement of around 7,000 miles for every hour (11,200 kilometers for every hour).

Fig. GPS Module image

Every GPS satellite transmission a message that incorporates the satellites current position, circle, and specific time. A GPS collector consolidates the communicates from different satellites to compute its careful position utilizing a measure called triangulation.

FINGER PRINT SENSOR: Unique mark scanners are security frameworks of biometrics. They are utilized to open entryways and in other security applications. During the 2010s unique mark scanners became ordinary on mobile telephones.

Fig. Finger print sensor image

RFID MODULE: RFID is an abbreviation for "radio-recurrence recognizable proof" and alludes to an innovation whereby advanced information encoded in RFID labels or savvy names (characterized underneath) are caught by a per user through radio waves. RFID is like barcoding in that information from a

tag or mark are caught by a gadget that stores the information in a data set. RFID, notwithstanding, has a few focal points over frameworks that use barcode resource following programming. The most striking is that RFID label information can be perused outside the view, though standardized identifications must be lined up with an optical scanner. It comprises of a scanner with reception apparatuses to send and get flags and is answerable for correspondence with the tag and gets the data from the tag.

Fig. RFID Reader module

GAS SENSOR: A gas detector is a gadget that identifies the presence of gases in a zone, frequently as a feature of a safety framework. This sort of gear is utilized to distinguish a gas leak or different outflows and can interface with a control system so a cycle can be naturally closed down. A gas indicator can sound an alert to administrators in the territory where the break is happening, allowing them the chance to leave. This kind of gadget is significant on the grounds that there are numerous gases that can be destructive to natural life, for example, people or creatures.

Fig. GAS SENSOR IMAGE

Gas identifiers can be utilized to detect combustible, flammable and toxic gases, and oxygen depletion. This sort of gadget is utilized generally in industry and can be found in areas, for example, on oil rigs, to screen make measures and developing advances such as photovoltaic. They might be utilized in firefighting.

MOTOR: Engine is a gadget that produce mechanical yield. The working of engine is given as follows: One is to utilize a sort of electric flow that occasionally switches course, which is known as an alternating flow (AC). In the sort of little, battery-fueled engines we use around the home, a superior arrangement is to include a segment called a commutator to the finishes of the curl. stress over the pointless specialized name: this somewhat antiquated word substitution is somewhat similar to the word drive.

Fig. Motor image

It basically intends to change to and forth similarly that drive intends to go to and forth. In its most straightforward structure, the commutator is a metal ring partitioned into two separate parts and its

responsibility is to invert the electric flow in the curl each time the loop pivots through a large portion of a turn.

CONCLUSION: In this project Raspberry pi based smart car security for theft control and accident notification was implemented. The proposed model consists of Raspberry Pi, Gas sensor, Finger print sensor, RFID, GPS are the input of the system. Here, Motor drivers, Motor, GSM, the buzzer is the output of the system. This system enhances the better vehicle security and safety for human life. It is reliable, securable and economical.

RESULT:

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