ANTI THEFT PROTECTION FOR VEHICLES BY GSM AND GPS WITH FINGERPRINT VERIFICATION USING IOT

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Abstract -An advanced vehicle monitoring and tracking system based on Embedded Linux Board and android application is designed and implemented for monitoring the school vehicle from any location A to location B at real time. The proposed system would make good use of new technology that based on Embedded Linux board namely Arduinoand Smartphone android application. The GPS current location of the vehicle; GPRS sends the tracking information to the server and the GSM is used for sending alert message to vehicle's owner mobile. The proposed system would place inside the vehicle whose position is to be determined on the web page and monitored at real time. In the proposed system, there is comparison between the current vehicle path and already specified path into the file system of Arduino. Here in the proposed system the already specified path inside the raspberry pi's file system taken from vehicle owner's android smartphone using android application. Means the selection of path from location A to B takes place from vehicle owner's android application which gives more safety and secures traveling to the traveler. Hence the driver drives the vehicle only on the vehicle owner's specified path. If the driver drives the vehicle on the wrong path then the alert message will be sent from the proposed system to the vehicle's owner mobile and also speakers alert driven using Arduino audio jack. If the vehicle's speed goes beyond the specified value of the speed, then also the warning message will be sent from system to the owner mobile

*Key Words***:**Arduino Mega, Arduino Nano, Fingerprint, GSM, GPS, Anti-Theft, Microcontroller.

1.INTRODUCTION

Internet of Things (IoT) is nothing but the devices (things) communicating with each other by using the internet. IoT is a trend-setting innovation in which all the data from sensors is stored in the cloud where it can be easily accessed from the cloud. Sensors and actuators for gathering the data and sending across the internet are also included in this advancement. We use cloud not only to store data but also for data analysis, gathering, visualization. The key characteristics of cloud include on-demand service provision, resource pooling and elasticity. Internet of Things (IoT) means communicating of devices with each other over the internet. Some applications of IoT are Smart energy, smart city health monitoring system. In IoT data is transmitted from sensors and they can be stored and analyzed by diverse IoT platforms like Blynk,Thinker. Thing speak in the present situation no less than one individual in the family has a vehicle, In the present age everybody inclination is changing regarding time, and they have to complete their works in restricted time, so the need to complete the work as fast as possible, because of that tendency they drive the vehicles very fast risking their lives in order to complete their work resulting to the cost of their life's. In some cases, without the intervention of us even we may fall to accidents due to others fault. In this present age the vast majority of them surmise that driving quick is form and those individuals think it is an excite driving quick, yet they couldn't comprehend that it is the greatest hazard that may risk to their lives. Despite with part of checking's a few people still take liquor and drive it prompts peril, it isn't protected to the general population and furthermore to the people in the vehicle. Due to over endure their work or having less rest hours may likewise prompt laziness and because of that the individual who is driving the vehicle may fall a rest or close the eyes for quite a while that may prompts deadly accidents, In few cases the temperature in the motor turns out to be high because of more warmth in the environment or because of loss of coolant these are the most widely recognized issues for the warmth in the engine, Most of the accidents occur because of not maintaining a proper distance between them this is also a serious problem that to be considered, to overcome these issues we had planned a vehicle observing and controlling framework, in that we have utilized distinctive sensors and gathered data from every sensor and data is analyzed using Blynk Application, and we had utilized a GPS module to track the data and here the Arduino has used.

Vehicle tracking/monitoring system is getting higher importance in modern era. Advances in technologies like Internet of Things (IoT), Ubiquitous computing and availability of economical Open source hardware systems, is

setting a new trend in system design. Monitoring of test vehicles is an essential activity for the Research and Development team of an automobile company which helps them to make required changes in vehicle components or design, depending on observations and results of the test vehicle. Maintaining records for test vehicles manually needs time and manpower. Sometimes keeping records manually for multiple vehicles can become complex and difficult for data analysis and comparison study. Use of technologies like Internet of Things (IoT) can ease the process of data collection and analysis. The Internet of things is nothing but networking of physical devices, vehicles or any other connected devices with electronics, software, sensors, network connectivity which enables these devices to collect and exchange data. IoT allows objects to be sensed and/or controlled remotely across existing network infrastructure. "Things" in the IoT can refer to wide variety of devices. These devices collect useful data using various technologies and then communicate with other devices.

For tracking the vehicle using GPS and maintain its database, MySQL database system is use which advanced feature of Arduino. In the database base monitoring and updating mechanism, the GSM/GPRS module is used which transmit the updated vehicle database to the server and user access the database using web page in Smartphone. That shows the real time vehicle location in the Smartphone. Thus, users will be able to continuously monitor a moving vehicle on demand using the Smartphone and determine the estimated distance and time for the vehicle to arrive at a given destination.

Fig -1: :Block Diagram of the Vehicle Ignition System.

2. METHODOLOGY

The main aim of this project is to prevent the vehicle from probable theft. To achieve this we are incorporating security by including biometrics, i.e a fingerprint. In the beginning the owner of the vehicle must store his/her own fingerprint in the finger print module. The GSM modem is used to send and receive messages to and from the owner. The owner's mobile number has to be set fixed during the coding. To start the ignition of the fourwheeler one should enter the authorized fingerprint. If anyone enters an unregistered fingerprint, the owner will immediately receive a message and the local alarm system will be turned on. For theft prevention, we can also

trace the four-wheeler by giving a call to the GSM modem which is embedded on the system. Then real time tracking begins and the GPS location of the vehicle is sent to the owner by SMS. The ignition of the vehicle can also be controller through notifications to the system. In this proposed project we are using GPS module to find the current latitude and longitude of the present location, the GPS module is UART (Universal AsynchronusReciever/Transmitter) with a baud rate of 9600 bps. We are using two serial ports. One, for the GSM modem and another one for the GPS modem. The coding is written in embedded c language and Arduino IDE was used to program it. It is a fitted device on the automobile. The whole monitoring of entire device is done by the mobile phone which delivers wireless connection amongst the vehicle tracking system device and the customer. The vehicle tracking device also has a dedicated sim card slot in which a GSM SIM card is inserted in to receive and send SMS. The user can send an SMS through his mobile phone, know the location of its vehicle and also theunderstanding of the whole operation of this vehicle tracking system is distributed in two parts: 1. Tracking the position of vehicle. 2. To provide security to vehicle. The vehicle tracking system consists of a GPS receiver which provides real time position of the automobile. This real time data is deposited in MMC(Main Memory Module) after a set time of intermission by the MCU(Main Control Unit). GSM module is undoubtedly associated with the MCU which is then used to propel and receive the SMS. GSM module takes the information from the MMC and sends this information to the registered user's mobile cell phone. This data consists of longitude, latitude, altitude, the speed over ground, and the course over ground, the real time and date. By using Google maps we can then locate the exact location of vehicle. The vehicle tracking system also has another singular feature which tells not only the whereabouts of vehicle but also securing the automobile. To know the location of the automobile, it is necessary to stop the automobile as soon as possible. For repossessing the automobile, we are using to convey the message in such a way they are allied to the buzzer and other is associated to the power supply of the engine of automobile. User can simply deactivate the engine of automobile by sending a message from his cellphone and we can get the automobile back very soon.
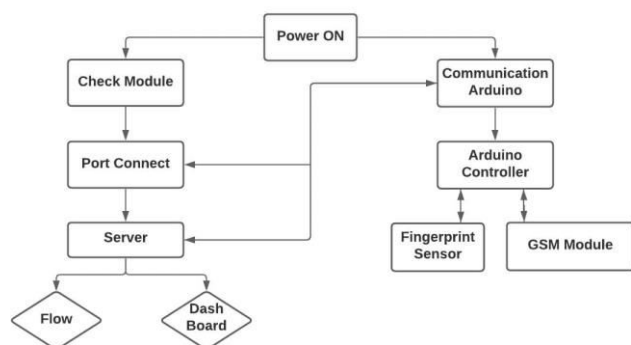
3. HARDWARE AND SOFTWARE

Arduino Nano Microcontroller

The Arduino Nano is a very smalll,a complete, and a breadboard-friendly board based on the ATmega328 orATmega168. It has almost the same functionality of the Arduino Duemilanove, but in a slightly different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one. The Nano was designed and is being produced by Gravitech.

Fingerprint Sensor

Optical fingerprint sensors have been around for a while. The way an optical scanner works is by shining a bright light over your fingerprint and taking a digital photo. The light-sensitive microchip makes the digital image by looking at the ridges

and valleys of the fingerprint, turning them into 1's and 0's, and creates the user's own personal code. Figure 2 shows how the light source reads the fingerprint and where that information goes. The disadvantage to this, while highly unlikely, is that a digital photo can be replicated.

GPS Module

Global Positioning System (GPS) makes use of signals sent by satellites in space and ground stations on Earth to accurately determine its position on Earth.The NEO6M GPS receiver module uses USART communication to communicate with microcontroller or PC terminal.It receives information like latitude, longitude, altitude, UTC time, etc. from the satellites in the form of NMEA string. This string needs to be parsed to extract the information that we want to use.

GSM Module

Global Positioning System (GPS) is a worldwide radionavigation system formed from the constellation of 24 satellites and their ground stations. The Global Positioning System is mainly funded and controlled by the U.S Department of Defense (DOD). The system was initially designed for the operation of U. S. military. But today, there are also many civil users of GPS across the whole world. The civil users are allowed to use the Standard Positioning Service without any kind of charge or restrictions.
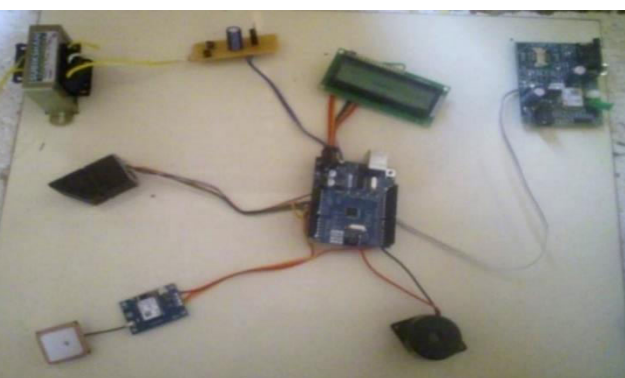

Fig -1: : Vehicle Ignition System.

4. ADVANTAGES

- The proposed model is economical and is highly efficient.
- The proposed model is user friendly.
- This model provides the better and extension in the automatic control of the vehicles.

- This system helps to avoid theft of vehicles by providing anti-theft security to the system.
- The system is flexible by using the Arduino Uno model.

5. CONCLUSION

The proposed fingerprint, GPS/GSM-based vehicle security system is the modern and reliable technique of security mechanism. The system which is developed by this project provides commodious protection against theft. The fingerprint sensor basically removes the use of key to start the ignition of the bike and it removes the threat of theft by

providing the additional layer of security to the vehicle. The

proposed model is highly economical in cost and it is very user friendly. And by using the GSM/ GPS modem, the real time location of the vehicle can be obtained and the ignition state of the vehicle can also be controlled by the users' smartphone.

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