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Smart Vehicle Tracking and Details Verification Security System

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Abstract— The growing population in developing countries, with the vehicle theft has become a common worry for all residents not only in urban but in rural too. Present technologies detect the theft frameworks, but lag the automatic tracking and controlling capacity. IoT (Internet of Things) and cloud have made the life style of people simpler and advanced in tracking and controlling the vehicles in transportation department. Hence there is a consistently a need to build up a security framework for a vehicle from issues like robbery and towing for utilization of IoT and cloud services for security of vehicles. Our framework proposes a novel security framework dependent on remote correspondence and an ease of using a MCU (Micro- Controller Unit). This framework model uses the GSM (Global System for Mobile Communication) technology for sending the messages in case the vehicle is unlocked or not in correct position. The owner/user can control the motor/start of the vehicle by turning it ON/OFF at ever scenario without the need for vehicle key using an app. The framework additionally utilizes a security lock mechanism during the theft. The IR (Infrared Ray) module/sensor utilizes the attempts to identify whether the vehicle handle is locked or not. The prototype also provides a solution to the verification of owner details such as driving license, RC (Registration Certificate) book etc., using cloud technology.

Keywords—Smart tracking, Details verification, Security system, Global System for Mobile Communication, Infrared Ray Sensors, Registration Certificate, Arduino, Internet of Things, Cloud Computing.

I. INTRODUCTION

The automobiles have been stolen for different reasons viz. for using the vehicles for transport, commission of crimes and for reusing or reselling the parts dismantled from the vehicles or resale of the vehicle itself. Inthis design,an automotive security system to disable an automobile and its key auto systems through remote control when it is stolen is designed. It hence deters thieves from committing the theft.It also effectively prevents stealing of key auto systems for re-selling by introducing air gesture security key. The details of system design and implementation are described further in this paper. To reduce the theft rate of the car and meet the intellectualized auto-guard demand of people, the vehicle is provided with the accelerometer for secret key gesture. GSMmodem finishes the setting and dismissing the prevention of message or call and controls the car state remotely. The IoT is the physical network of thingsorobjects—devices, buildings, vehicles, and other items—embedded with electronics, software, sensors, and network connectivity that enables these things or objects to collect and exchange the data. An anti -theft systemis any device or technique used to prevent or deter the unauthorized appropriation of items that is considered valuable. IoT and Cloud interaction is expected to produce high degree of human to machine communication along with machine to machine communication. The primary objective of this design is to reduce the human work by automatic verification of details and providing the security to the system. Automationhas always been a prime factor for security system. This system offers controlling through a hand-held mobile phone by means of IoT technology. The vehicles that are stolen are used for various reasons can e parts destroyed from the vehicles or resale of the vehicle itself. In thift used for their own transport, performing some wrong things and also for reuse or exchange of ths scenarios, a security framework to handle the theft anditsauto key system through which the theft can be controlled is very much needed. Henceforth stops the criminals from performing the vehicle robbery. It additionally successfully taking of key auto frameworks for exchanging by presenting air motion security key. The framework structure and usage are portrayed further in this pap Designed technology, vehicle tracking and monitoring systems with automatic owner verification details created an innovation in the security of the vehicles. In this design, the hardware is fitted on to the

vehicle in such a manner that it is not visible to anyone who is inside or outside of the vehicle. Thus, it is used as a covert unit which continuously or by any interrupt to the system, sends the location data to the monitoring unit. When the vehicle is stolen, the location data from tracking system can be used to find the location and can be informed to police for further action. Some vehicle tracking system can even detect unauthorized movements of the vehicle and then alert the owner. This gives an edge over other pieces of technology for the same purpose. This accident alert system in it detects the accident and the location of the accident occurred and sends GPS coordinates to the specified mobile, computer etc. The fire detector circuit in it is used to detect fire in the vehicle, if the temperature inside the vehicle goes above a certain limit then a warning will be automatically send to the intended receiver. The infrared sensor which is additionally interfaced to the microcontroller is used to detect the obstacles and accidents, in any case if any mishap occurs then its warning will be directly send to the intended receiver. When a request by user is sent to the number at the modem, the system automatically sends a return reply to that particular mobile indicating the position of the vehicle in terms of latitude and longitude. A Program has been developed which is used to locate the exact position of the vehicle and also to navigated track of the moving vehicle on Google Map.

II. LITERATURE SURVEY

Verma, Pankaj, and J. S. Bhatia. [1] proposed a global positioning framework wherein GPS is one of the innovation that are utilized in immense number of utilizations today. One of the applications is following the vehicle and normally checking them. This global positioning framework can advise the area and course went by vehicle, and that data can be seen from another distant area. It additionally incorporates the web application that gives careful area of target. This framework empowers us to follow the objective in any climate conditions. This framework utilizes GPS and GSM advancements. This likewise incorporates the equipment part which contains GPS, GSM, at mega microcontroller MAX 232,16x2 er. To diminish the burglary pace of the vehicle and meet the intellectualized auto-watch solicitation of people, the vehicle is giveen the accelerometerfor riddle key sign. GSM Modem finishes the setting and pardoning the evasion of message or call and controlsthevehicle state indirectly. For interfacing all the requiredmodules LCD and software part is used and a web application is also developed at the client side.

Ramani, R., et al. [2] proposed a vehicle followingand securing framework which if their own vehicle is tracked, at leaving and furthermore once in a while blocking at driving in-security places. The wellbeing of vehicles is huge basic for open vehicles. Vehicle following and securing the framework introduced in the vehicle, to follow the spot and the motor engine is utilized. The spot of the vehicle is distinguished utilizing GPS and GSM. These frameworks continually screen a moving vehicle and report the status on request. At the point when the burglary distinguished, the individual sends SMS to the microcontroller, the microcontroller thus gives the control signs to stop the motor engine. Approved individual needs to send the secret phrase to regulator, so the vehicle can restart and open the entryway.This framework is more made sure about, dependable and minimal effort.

Lee, SeokJu, Girma Tewolde, and Jaerock Kwon.[3] proposed the work on IoT in which a productive vehicle global positioning framework is planned and executed for following the development of any prepared vehicle from any area whenever. The proposed framework utilized a famous innovation that joined a Cell phone application with a microcontroller. The structured in-vehicle gadget work sutilizing GPS and GSM/GPRS innovation that is oneofthemost widely recognized ways for vehicle following. Thegadget is implanted inside a vehicle whose position is to solved and followed continuously, that joins a Cell phone demand with a microcontroller. The structured in-vehicle gadget works utilizing GPS, GSM innovation that is oneofthe most widely recognized ways for vehicle following. Thegadget is installed insidea vehicle whose positionistoberesolved and followed continuously.

Athavani, Shahin. [4] proposed a global positioning framework wherein GPS and GSMprocedure is utilizedinvehicle global positioning framework to followandgivetotalarea and send data to client over cell phone. It gives minute-by-minute updates about vehicle area by sending SMS through GSM modem. The SMS sent contains longitude and scope of the area of vehicle. Microcontroller is theFocalHandling Unit (CPU) of this structure. Microcontroller getsthe directions from GPS modem and afterward it sends this data to the client in text SMS. GSM modem send this data by means of SMS. SMS will be sent to the proprietor of the vehicle.

Jahan, N., Hossen, K., &Patwary, M. K. H.

[5] proposed the work, wherein. The proposed framework gives bit of leeway of two principle highlights in versatile stage these days which are area administrations, essentially GPS, and fundamental communication administrations,

primarily SMS. The framework comprises of different sides, worker side and customer side. The worker gadget gives the specific area of the transport to the worker, or to the client, in the event of SMS based question from customer's gadget. On the other hand, the customer's contraption can use SMS organization or Web admittance to find the vehicle territory. In the event that customers' gadget is an android based cell phone, can introduce application to follow transport area utilizing internet providers.

In existing systems, the vehicle global positioning framework has been proposed by using the GPS which takes the fundamental data in customary premise by means of satellite, and furthermore utilizes GSM to send and get information between the client and the framework. The connection between the client and the vehicle is intended to be by means of Short Message Administrations (SMS). Just as in the event of burglary or extent of work flight, the client has the capacity of turning vehicle motor off distantly. Despite the fact that, liquor sensor is utilized to turn off the vehicle if there should arise an occurrence of alcoholic driver. To keep spare separation before the vehicle, super sonic sensor is utilized. The framework is being structured utilizing programming then it is interfaced with equipment, results have been gotten which demonstrated exactness in situating and quick reaction to client orders. One of the preventive techniques to stop mishap partner with the gas spillage is to introduce a gas spillage discovery unit at weak spots. It likewise gives security plan by identifying the spillage of LPG which is material for the private premises. The spillage of gas is detected by gas sensor and informed to the client through SMS and a call utilizing GSM, which is useful for changing this basic gadget into a most exceptional gas indicator framework later on.

III. PROPOSED MODEL

Smart security system is proposed todesignanembedded system which is used for tracking andpositioningof any vehicle by using Global Positioning System(GPS)andGSM. The current design is an embedded application, whichwill continuously monitor a moving vehicle andreport thestatus of the vehicle on demand. For doing so an 8052microcontroller is interfaced serially to a GSM Modem and GPS receiver. A GSM modem is used to send theposition(Latitude and Longitude) of the vehicle froma remoteplace.The GPS modem will continuously give the data i.e. the latitude and longitude indicating the position of thevehicle.The same data is sent to the mobile at the other end from where the position of the vehicle is demanded. An EEPROM is used to store the data received by GPS receiver. Thehardware interfaces to microcontroller are LCD, GSM modem and GPS Receiver. The design uses RS-232protocolfor serial communication between the modems and the microcontroller. Different types or sensors suchas infrared sensors and fire detectors are used for detecting different types of problem encountered in the vehicle such as theft,accident, fire warning etc. In any of these cases messageswillbe automatically send to the intended receiver. Vehicle tracking system is one of the advanced technology to track the activities of the vehicle. In this approach, the vehicle owners are able to track their vehicle on a real-time basis. Due to real time tracking facility, vehicle tracking systems are becoming increasingly popular among the expensive vehicles owners todetect theft and also secure their vehicle without much tensions

IV. BLOCK DIAGRAM

In this section, a schematic representation of the designed system is as shown in the Figure 1. and its detail design is discussed here. Our design mainly consists of tw oparts :

A. Vehicle unit
B. Document verification unit

A. VEHICLE UNIT

Smart vehicle tracking provides a one-stopsolutionto view and manage the vehicles fromthe comfort of theirown workplace whether the vehicle is in the warehouseorsafely parked, a automated GPS tracker always stayconnectedto the owners device. Smart vehicle GPS tracker remotelycontrols the vehicles from anywhere, and provides aremotelocking and unlocking with the GPS- based tracker running on online. In the unfortunate event of any vehicle theft, smartvehicle tracking helps in recovering the assets. To increase the security level and detect the vehicle unlocking without akey, vehicle handle lock break down detection also included in the design.

B. DOCUMENT VERIFICATION UNIT

Document verification unit verifies all the required documents in the (Radio-Frequency Identification Device) RFID tag, and designed here like a key chain or a debit card type as shown in Figure 2. Here all the documents are stored in cloud and retrieved back when scanned by the RFID reader and the details can be observed on the screen which is usually a personal computer. IoT technology is used to retrieve the information back which is stored in the cloud.

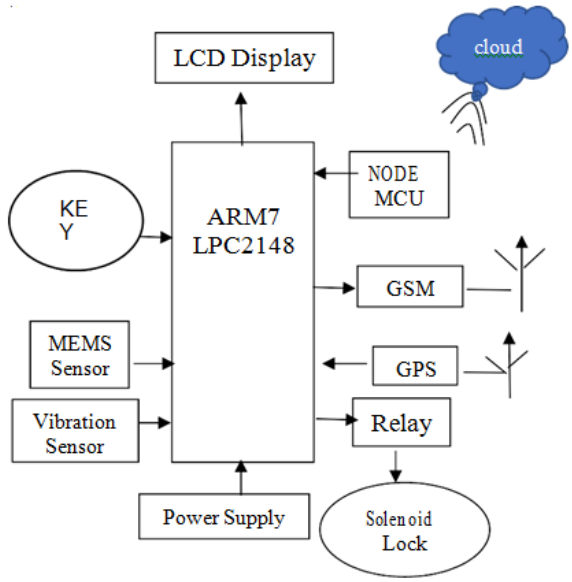

Figure 1. Block diagram of Vehicle unit

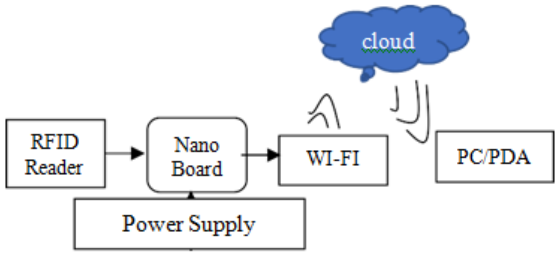

Figure 2. Block diagram of document verification unit

V. RESULTS

When the owner parked the vehicle in parking place.Then any one accessed the vehicle it sends signal to the owner that it is being stolen as shown in Figure 3. If he again sends the SMS to the vehicle to stop then the ignition cutoff, fuel supply become switched off. When the power supply is turned ON, the LCD displays whether the engine is locked or unlocked and even indicates that there is any issue with the vehicle. The blynk app allows the engine to be locked or unlocked at anytime and anywhere.The user will then receive an alert message indicating engineis remotely locked or unlocked. If the vehicle is tiltedleft orright for 10seconds in the same position, the user will receivean alert message and location of the vehicle indicating that thevehicle has been detected to fall.

Figure 3. Application of the app: (a) locking engine through app. (b)messages received when engine is locked, vibration sensor is activated & vehicle fall is detected with GPS position.

When the vehicle is damaged a vibration alert will be given. When the 2 wires are touched, LCD shows that vibration sensor is activated and then user will receive an alert message indicating vehicle is vibrated. This type of tracking device as shown in Figure 4, will be with the traffic police person. As soon as the power supply is connected, it sends commands to Wi-Fi, so whenever the card is scannedby RFID reader,it shows card holder's name in the LCD and sends ID details to the cloud using Wi-Fi. All details related to the card will be shown in the PC. This can be like thedetails of adhaar card , driving license etc.,.

VI. APPLICATIONS AND ADVANTAGES

Towards the booming technology, using the smartphone ,that is used to control a vehicle can also be used in various feilds that includes: Military, Navigation, Automobile Industry, Aircrafts, Remote sensing and monitoring, Remote control, Security systems, Tele services and so on. The microcontroller that has been used in this design have built-in ADCs and hence the controller is capable of accepting analog inputs, which is the add on advantage and its services includes: Fleet monitoring, Vehicle scheduling , Route monitoring, Driver monitoring, Accident analysis, Geo-fencing, Geo-coding and so on.

Figure 4. LCD read when functions are activated: (a) LCD displaying when engine is locked, vehicle fall is detected, ignition lock and vibration sensor is activated. (b) LCD read when system is normal.

VII. CONCLUSION AND FUTURE SCOPE

The existing systems do not implement the document verification unit which is very necessary nowadays because the innocent people are been harassed because of unfortunately forgetting their necessary documents and some owner details such as driving license, documents of the vehicle etc. Also intruders can easily try to open the hand lock of a vehicle and the vehicle would be stolen. This is a major drawback, which is overcome efficiently in our design. The system is able to able to do user authentication for access control and monitor the vehicle for any suspicious activity also. Thus a double security system has been realized in this design interactively on vehicles to overcome the drawbacks as discussed. The security system is equipped with an emergency safety feature by utilizing GSM communication to turn off the machine of the vehicle when it is stolen. The methodology of the design lies in replacing the conventional security systems with the IoT, where the vehicles are connected to the internet and can be accessed from anywhere by means of an android Smartphone. Also the need for carrying all the important documents are reduced here. The required documentsarestored in the cloud and can be accessed using the RFID given. This vehicle tracking and accident alert feature plays a major important role in day to day life and in mere futuretoo.As a future work, the sensitivity and accuracy of thedevicecan be increased.

REFERENCES

[1]. Verma, Pankaj, and J. S. Bhatia. "Design and development of GPS-GSM based tracking system with Google map based monitoring." International Journal of Computer Science, Engineering and Applications 3.3 (2013): 33.

[2]. Ramani, R., et al. "Vehicle tracking and locking system based on GSM and GPS." IJ Intelligent systems and Applications 9 (2013): 86-93.

[3]. Lee, SeokJu, GirmaTewolde, and Jaerock Kwon. "Design and implementation of vehicle tracking system using GPS/GSM/GPRS technology and smartphone application." 2014 IEEE world forum on internet of things (WF- IoT). IEEE, 2014.

[4]. Athavani, Shahin. "Vehicle tracking system using GPS and GSM technology." (2017).

[5]. Jahan, N., Hossen, K., &Patwary, M. K. H. (2017). Implementation of a vehicle tracking system using smartphone and SMS service.

[6]. 2017 4th International Conference on Advances in Electrical Engineering (ICAEE).

[7]. Mangla, N., Sivananda, G., Kashyap, A., & Vinutha. (2017) "GPS-GSM predicated vehicle tracking system, monitored in a mobile app based on Google Maps". 2017 International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS).

[8]. Uddin, M. S., Ahmed, M. M., Alam, J. B., & Islam, M. (2017). Smart anti-theft vehicle tracking system for Bangladesh based on Internet of Things. 2017 4th International Conference on Advances in Electrical Engineering (ICAEE).

[9]. Plangi, S., Hadachi, A., Lind, A., &Bensrhair, (2018). Real-time Vehicles Tracking Based on Mobile Multi-sensor Fusion. IEEE Sensors Journal, 1–1.

[10]. S, M., V, K., & V, M. (2019). Vehicle Theft Tracking, Detecting and Locking System Using Open CV. 2019 5th International Conference on Advanced Computing & Communication Systems (ICACCS).

[11]. Liu, C., & Hedrick, J. K. (2017). Model predictive control-based target search and tracking using autonomous mobile robot with limited sensing domain. 2017 American Control Conference (ACC).

[12]. Vardhan, G. S., Sivadasan, N., & Dutta, A. (2016). QR-code based chipless RFID system for unique identification. 2016 IEEE International Conference on RFID Technology and Applications (RFID-TA).

[13]. Buffi, A., &Nepa, P. (2017). An RFID-based technique for train localization with passive tags. 2017 IEEE International Conference on RFID (RFID).
[14]. Abdelnour, A., Kaddour, D., &Tedjini, S. (2018). Transformation of Barcode Into RFID Tag, Design, and Validation. IEEE Microwave and Wireless Components Letters, 28(5), 398– 400.