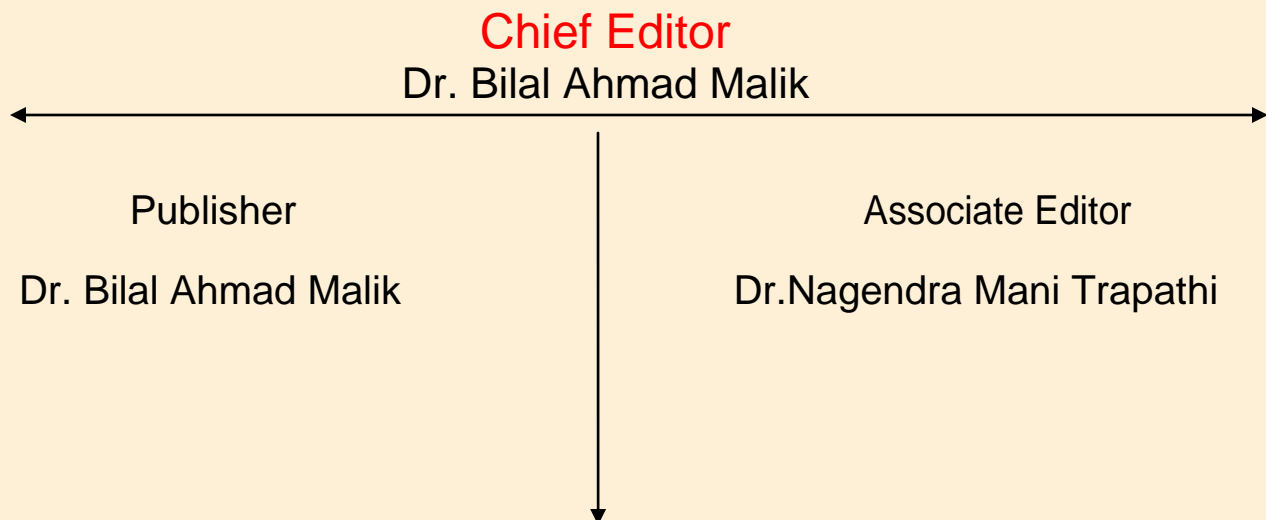# North Asian International Research Journal Consortium

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THEFT CAR TRACKING AND CONTROLLING

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Abstract- *It is a car security system that offers excellent protection to your car. This system provides real time protection to our car. This system provides the location of car as well as lock the ignition system of car at real time and capture the image of thief. So a more developed system makes use of an embedded system based on GSM technology. The designed & developed system is installed in the vehicle.*

Keyword- *Microcontroller, GSM modem, GPS modem, Ignition Locking system, spy camera*

I.   INTRODUCTION

In the present growing economy, the country also faces the uprising of crime rate. Car theft, which is the main concern for the conduct of this project, is one of the biggest crimes which is hard to eliminate. The latest trend of car theft involves the car being towed away, and also alarm signal capturing where the alarm disabler signal can be traced and duplicate by a thief with the device to capture the signal and use it to disable the alarm. According to the Office for National Statistics, there were almost 358,000 reported instances of thefts from or of a motor vehicle in 2014, with at least 30,000 going uninvestigated. And with car thieves finding new ways to make car crime work for them, such as the recent "pinch and park" trend, it isn't a problem that's going away any time soon.

Vehicle navigation is one of the most important applications in the field of navigation which is mostly used by drivers. The maps given to the driver in the system plays most important role in this field. When large object or vehicles were spread out over ground, the owner corporations often found it difficult to keep track of what was happening. They required some type of system to determine where each object was at any given time and for how long it travelled. Also the need of tracking in consumer's vehicle use to prevent any kind of theft because police can use tracking reports to locate stolen vehicle. GSM

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and GPS based tracking system will provide effective, real time vehicle location, and reporting. A GPS-GSM based tracking and controlling of theft car system will inform where your vehicle is and where it has been, how long it has been. The system fetches the geographic location and time information from the Global Positioning Satellites. During vehicle motion, its real-time parameters such as location are reported by SMS message. The system takes advantage of wireless technology in providing powerful management transportation engine.

II. ORGANIZATION OF THE PAPER

The initial section of this paper consists of a literature review of some past attempts made in the area of our interest. The paper further gives a detailed discussion of problem identification and its solution. The solution of the problem is suggested by the proposed design of vacuum cleaner under the category 'Proposed Design '. The discussion deepens further under the section 'Results and Discussion'. Then the conclusion is given with some probable future changes in the design. The past work done in this area is also appreciable and we have taken much reference from the past attempts. But further changes might be possible in the proposed design in this paper as stated in the 'conclusion' section.

III. LITERATURE REVIEW

Chen, H., Chiang, Y. Chang, F., H. Wang, H.[1], The hardware and software of the GPS and GSM network were developed. The proposed GPS/GSM based System has the two parts, first is a mobile unit and another is controlling station. The system processes, interfaces, connections, data transmission and reception of data among the mobile unit and control stations are working successfully. These results are compatible with GPS technologies.

Asaad M. J. Al-Hindawi, Ibraheem Talib [2], A vehicle tracking system is an electronic device, installed in a vehicle to enable the owner or a third party to track the vehicle's place. This paper proposed to design a vehicle tracking system that works using GPS and GSM technology. This system built based on embedded system, used for tracking and positioning of any vehicle by using Global Positioning System (GPS) and Global system for mobile communication (GSM). This design will continuously watch a moving Vehicle and report the status of the Vehicle on demand.

Kunal Maurya, Mandeep Singh, Neelu Jain [3], Face Detection System used to detect the face of the driver, and compare with the predefined face. The car owner is sleeping during the night time and someone theft the car. Then Face Detection System obtains images by one tiny web camera, which is hidden easily in somewhere in the car. Face Detection System compared the obtained images with the stored images.

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If the images don't match, then the information sends to the owner through MMS. The owners get the images of the thief in mobile phone and trace the place through GPS. The place of the car and its speed displayed to the owner through SMS. The owner can recognize the thief images as well as the place of the car and can easily find out the hijackers image. This system applied in our day-to-day life.

Vikram Kulkarni & Viswaprakash Babu [4], This system provided vehicle cabin safety, security based on embedded system by modifying the existing modules. This method monitors the level of the toxic gases such as CO, LPG and alcohol within the vehicle provided alert information as alarm during the dangerous situations. The SMS sends to the authorized person through the GSM. In this method, the IR Sensor used to detect the static obstacle in front of the vehicle and the vehicle stopped if any obstacle detected. This is avoiding accidents due to collision of vehicles with any static obstacles.

V.Ramya, B. Palaniappan, K. Karthick [5], This system provided vehicle cabin safety, security based on embedded system by modifying the existing modules. This method monitors the level of the toxic gases such as CO, LPG and alcohol within the vehicle provided alert information as alarm during the dangerous situations. The SMS sends to the authorized person through the GSM. In this method, the IR Sensor used to detect the static obstacle in front of the

vehicle and the vehicle stopped if any obstacle detected. This is avoiding accidents due to collision of vehicles with any static obstacles.

Sonika Kashyap, Faiz Firoz, Ayush Rajput, Shivani Chaudhary[6], They further carried out research paper on the explanation of block with more modifications in the proposed block diagram. The additional feature in their research paper are spy camera the real time operation of system.

IV. BLOCK DIAGRAM
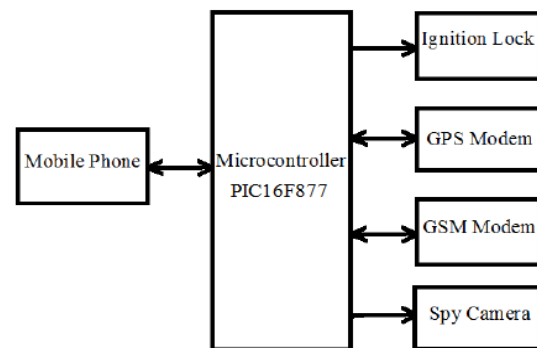
Fig.1: Block diagram

- **Mobile Phone**

    Mobile Phone is used to communicate with the GSM modem from remote location. Firstly when the thief starts driving the car then the location of the car is given to the mobile phone by the sms send by GSM at remote location to alert the car owner. Then the car owner need to send a code for the ignition locking, since the ignition locking relay system is communicated with the microcontroller PIC16F866

then at the instant of locking sms reached the car will be locked at the its location. So, the mobile phone is all here to deal with the automation of the project.
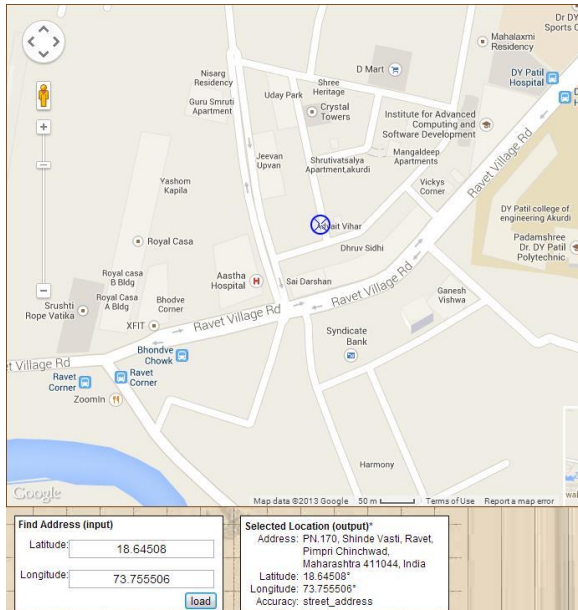

Fig.2: Location of theft car on Google map

The mobile phone also consider with the Google map to find out the location of the vehicle at which road. The car owner then puts the longitude and latitude in the google to find out the location of the theft car. The google map shows the exact location for specific parameters.

- **PIC16F877 Microcontroller**

Peripheral Interface Controllers (PIC) is one of the advanced microcontrollers developed by microchip technologies. These microcontrollers are widely used in modern electronics applications. A PIC controller integrates all type of advanced interfacing ports and memory modules. These controllers are more advanced than normal microcontroller like INTEL 8051. The first PIC chip was announced in 1975 (PIC1650). As like normal microcontroller, the PIC chip also combines a microprocessor unit called CPU and is integrated with various types of memory modules (RAM, ROM, EEPROM, etc), I/O ports, timers/counters, communication ports, etc.

- **Ignition Locking**

Ignition Locking of system consists of electromagnetic relay, 9 volt battery and two dc motos connected in parallel. The power supply is given to the motors using 9volt battery whose one terminal is connected to relay and the other one is directly connected to the motor. Initially when the message is not given to the GSM the motors will rotates normally but when the locking code is send to the GSM then the relay will switch off the circuit between the motor and the battery, so ignition system of the car will become locked.

- **GSM Modem**

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. A GSM modem can be a dedicated modem device with a serial, USB or

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Bluetooth connection, or it may be a mobile phone that provides GSM modem capabilities.

- **GPS Modem**

The Global Positioning System (GPS) is a satellite-based navigation system consists of a network of 24 satellites located into orbit. The system provides essential information to military, civil and commercial users around the world and which is freely accessible to anyone with a GPS receiver. GPS works in any weather circumstances at anywhere in the world. Normally no subscription fees or system charges to utilize GPS. A GPS receiver must be locked on to the signal of at least three satellites to estimate 2D position (latitude and longitude) and track movement.

- **Spy Camera**

The spy camera is hidden camera on the just front upward of the driver. As when the ignition locking of the car is done then the image of the thief is captured by getting signal from PIC16F877 Microcontroller. Then the captured image is saved in the memory, this image is used to catch the thief by the police.

V. FLOW CHART
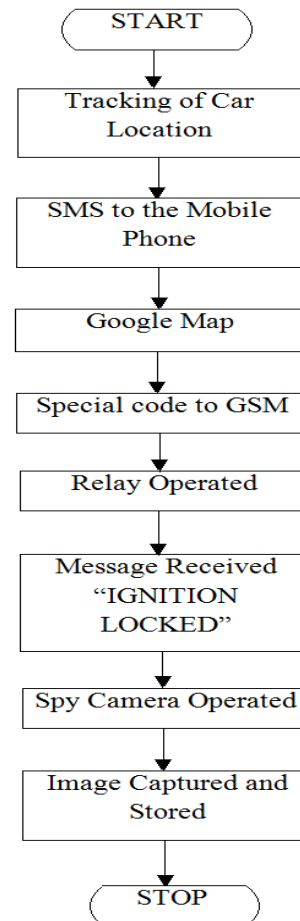

Fig.3: Flow Chart

Flow chart of tracking and controlling og theft car depicts the complete working of the system, which is as follows:

- Initially when the car is started to steal by the thief then the tracking of the location of car is done by the GPS modem. GPS modem receives the signal given by the microcontroller, since the GPS is connected with its receiver to the microcontroller.

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- After tracking the location of the car, the GSM modem then send sms to the car owner which contains the location of the car in form of the longitude and latitude. Since the location traced by the GPS is always in longitude and latitude form.

- After getting the location of the car by the car owner in the form of longitude and latitude, the car owner needs to specify the exact location of car using Google map. Then after putting the longitude and latitude of the car into the Google map, the car owner gets the physical location of the car on the road.

- Special code is the cade which is only given to the car owner or the person whose contact no. is programmed in the microcontroller. This special code is programmed such that while receiving this code by the GSM modem the ignition system of the car gets locked. So this special code is send to the GSM modem for the ignition locking of the car.

- The electromagnetic relay gets operated after getting the special code by the car owner. Electromagnetic relay is connected with the motors connected in parallel and the battery. So when the relay gets operated then it disconnects the supply of the car motor.

- After the car ignition locking is done the message of "IGNITION LOCKED" is forwarded by the GSM modem. This is done by the signal about the car locked given by microcontroller to the GSM modem.

- The next step of the tracking and controlling of theft car system is the operation of the spy camera. The spy camera gets started to capture the image of the thief sitting on the driving seat. The spy camera is used so as to caught the thief, since in any case thief can run away after the car get stopped.

- The image is then captured and stored in the memory of the camera. Then the working of the project gets completed and the project gets stopped.

VI. PROBLEM IDENTIFICATION AND ITS SOLUTION

The major problem faced by us in the initial phase was of the spy camera, i. e, whether how it has to be implemented because it is the additional and the best feature of tracking and controlling of theft car.

VII. DESIGN AND IMPLEMENTATION OF PROPOSED SYSTEM

This system has the four technologies in it that are GSM modem, GPS modem, ignition locking, spy camera. The Global System for Mobile Positioning System (GSM) modem is used to communicate with the mobile phone, it gives the location of car using sms with the help of GPS. The ignition locking of the car is done by sending sms to GSM. At the moment of

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ignition locking the image of thief is captured by the spy camera.
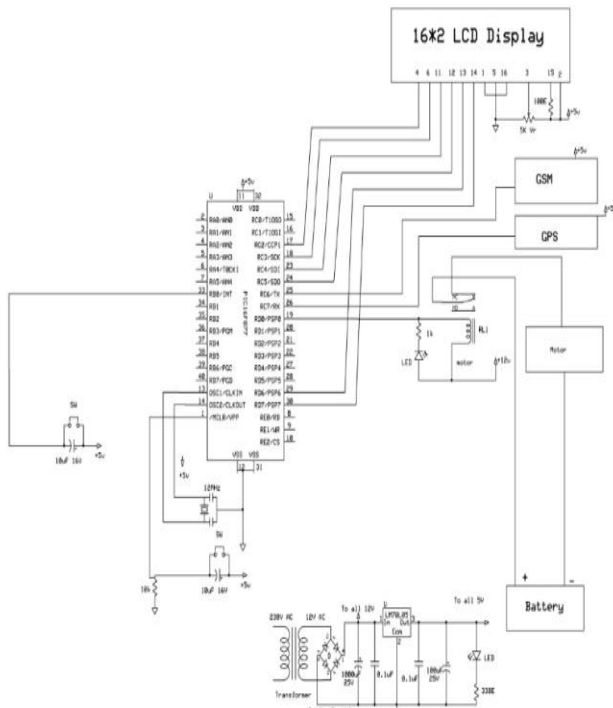
VIII. WORKING

Fig.4: Internal Architecture

Initially when the microcontroller realizes the starting of the car then if the car owner is there in the car the he will off the tracking and controlling of theft car system so as the system will not work sparely. But when thief tries to steal the car then he must be unknown about the tracking and controlling car system inside the car and will off the system.

So when the car starts then then the microcontroller sends signal to the GPS modem to track the location of the car in the form of longitude and latitude. The range of GPS modem is 1800Hz.

The GPS modem is used only for the location tracking, so it is connected through its receiver terminal only to the PIC16F877 microcontroller. Both GPS and GSM modem are using PIFA (Planar Inverted-F Antennas) antenna and MAX232 for interfacing with the PIC16F877 microcontroller. The longitude and latitude traced by the GPS are forwarded to the GSM modem. The GSM modem having range of 900Hz and using 3G sim to send the location of the theft car to the owner's mobile phone.

Google map is required by the car owner for tracking the location of the car, then the map shows the exact location of the car by putting longitude and latitude in it. Then by getting the location of the car, the car owner needed to send a special code to lock the ignition system of the car at the location of it given by the GPS modem. This special code can only be send by the car owner to the GPS modem, since the programming of the microcontroller is done only for the car owner so as the car owner can only communicate with the GSM modem. Then after getting the special code through the sms by the GPS modem the microcontroller then send signal to the relay for the locking of the ignition system of the car. The electromagnetic relay operates to cut off the supply of the car motors. At the moment of the ignition locking the message about the locking of the car that 'ignition locked' is send to the car owner to specify the locking of the car. This whole working of

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the tracking and controlling of the theft car system takes place at the real time.

The additional feature in the tracking and controlling of theft car system also takes place at the moment of ignition locking, which is spy camera that is also given a signal to capture the image of thief. The spy camera is placed in front of the driver seat, so it capture the image of the person driving the car.

IX.   RESULT

The proposed design aims to provide a cost effective, portable device which can be used to provide the best security to the car. It gives satisfaction to the people about that their car cannot be stolen by any thief. The hardware view of tracking and controlling of theft car is shown below:

Fig.5: Hardware of tracking and controlling of theft car system on prototype car

Our research has led us to implement the design presented in this paper, but even more efficient designs can be made which may overcome the difficulties faced by our design of "Tracking and Controlling of Theft Car".

X.   CONCLUSION

The main motive of the tracking and controlling of theft car system is to save our car from stealing so as to give it the best security in all aspects. This system is completely integrated and it becomes possible to the user to track his car very easily at any time and from anywhere. As the vehicle theft is increasing day by day but due to this people can't avoid buying vehicles but they found an efficient way to keep an eye on their vehicle without being very close to them. These systems can keep a good control on the thefts and help avoiding them to some extent. Basically in all these system the GPS & GSM are used to track the vehicle. Using this system the user can determine where the vehicle is, how much has it travelled, and the distance completed by it. The user is able to access the position of his vehicle at any instant of time.

XI. FUTURE SCOPE

The tracking and controlling of theft car system is best in all its aspects but instead of this we can do some more modifications in it to make use for many applications in a better way. Some of the

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modifications that can be done in tracking and controlling of theft car system are as follows:

- We can use the EEPROM to store the previous Navigating positions up to 256 locations and we can navigate up to N number of locations by increasing its memory.
- We can increase the accuracy up to 3m by increasing the cost of the GPS receivers.
- We can use one more camera or cctv to see the outer location of the car inspite of being GPS coordinates.
- We can use our kit for detection of bomb by connecting to the bomb detector.
- With the help of high sensitivity vibration sensors we can detect the accident.

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