GPS and GSM/GPRS Based Futuristic Automobile Live Detection and Protection Technology

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Abstract— the new method of vehicle tracking and locking system is introduced here. In the proposed methodology design, development and deployment of GPS (Global positioning system) and GSM (Global system for mobile communication)/GPRS (General Packet Radio Service) based vehicle tracking and locking system which provides status of vehicle in real time and security from the robbery and attacks. When the theft identified locking system will be in the active mode and controller issues signal to engine motor to reduce the speed gradually and within some seconds vehicle will be in the off state. In the same time all the doors will be locked. Locking system will be work based on the password authentication method deployed in the system.

Keywords: Global Positioning System, Global System for Mobile Communication, General Packet Radio Service, Locking system, IR Sensor, PIC16F877A

I. INTRODUCTION

Today satellite communication is very effective in all the applications. Through the satellite communication technology user can easy to identify the vehicle locations. Vehicle tracking systems has brought this technology to the day-to-day life of the common person. Today GPS used in trucks, cars, ambulances and police vehicles on the roads of developed countries. All the existing technology support tracking the vehicle place only they are not providing security for the vehicles. Through this system can reduce robbery, rape, attacks…etc.

II. OVERVIEW

The place of the vehicle identified using Global Positioning system (GPS) and Global system mobile communication (GSM)/General Packet Radio Service (GPRS). These systems constantly watch a moving Vehicle and report the status. If any person needs to handle the vehicle he needs to enter the password. If the password typed is wrong suddenly microcontroller issues the control signals to stop the engine motor as well as locks the doors. Authorized person need to enter the password to restart the vehicle and open the door. This is more secured, reliable and low cost. Tracking system always in the active mode, so monitoring person can get the status of vehicle in a particular interval of time. The project ‘Tracking and locking’ is a part of a Security and Surveillance system. Transmission in real-time ensures that the propagation delay is minimal. Transmission of information can be done either by SMS, TCP/IP connection over the internet using GPRS (General Packet Radio Service) modem/satellite transmission using a satellite modem.

The remote monitoring station and software-monitoring centre are implemented by using Visual Basic or related software. The result of this demonstration shows that the system can watch and control the remote communication between the vehicle and the remote monitoring station.

III. RELATED WORKS

Years of research in security and surveillance has demonstrated that significant improvements on the position detection and security for object which may be vehicles, person or other objects. Tracking of vehicles may be achieved by using a lot of techniques such as Traffic surveillance system for detecting and tracking moving vehicles in night-time traffic scenes. This method identifies vehicles by detecting and locating vehicle headlights and taillights using image segmentation and pattern analysis techniques.

Development and deployment of GPS based vehicle tracking and alert system which allows intercity transport companies to track their vehicles in real time and provides an alert system for reporting armed robbery and accident occurrences.

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. Through this system vehicle owner only can handle
the vehicle.

IV. PROPOSED ALGORITHM

In this proposed work, a novel method of vehicle
tracking and locking system used to track the vehicle,
thief vehicle by using GPS and GSM/GPRS technology. In this
system, suppose GPS will fell in failure mode GSM/GPRS
part will sends the status of vehicle on demand. Locking
system puts into sleeping mode while the vehicle handled
by the owner or authorized person otherwise goes to active
mode, the mode of operation changed by in person or
remotely. If any interruption occurred in any side of
the door, then the IR sensor senses the signals, which leads to
locks the all doors until the password authentication is
matched. When the unauthorized usage identified,
controller issues the control signals to the engine motor.

Engine motor speeds are gradually decreases and come to
the off place. Same time all the doors will be locked. To
open the door or restart the engine, authorized person needs
to enter the passwords.

In this method, tracking of vehicle place easy and
doors locked automatically according to the interruption
occurred in the sides of the doors, thereby thief cannot get
away from the car/Vehicle. Tracking part always in active
mode, it never moves to sleep mode. Every interval of time
monitoring person can get the position status of the vehicle
by the help of GPS and GSM/GPRS. The Vehicle Tracking
System being proposed in here is a GPS, GSM/GPRS
based system that can track the position of the Vehicle in
real time and also record the events for later review. This
Tracking System aims at providing an efficient
management of the Vehicle including the security.

This system is a complete solution for the existing
system. It satisfies many of the requirements and provide
platform for the solution for future problems. Figure 1
shows the complete block diagram. In this system relay
will provide sufficient voltage to engine motor to works
properly.

A. Circuit Descriptions

The power supply section is very important in
all electronic circuits and applications. The 230V, 50Hz
AC mains is stepped down by transformer to deliver a
secondary output of 12V, 500 mA. The transformer output
is rectified by a full-wave rectifier comprising diodes.

Filtered by capacitor and regulated by ICs 7812 and 7805.
The circuit diagram of the vehicle tracking and locking
embedded system using GPS and GSM/GPRS technology
is shown in figure 2. The compact circuitry is built around
PIC16F877A microcontroller. PIC microcontroller is the
first RISC (Reduced Instruction Set computer) based
microcontroller fabricated in CMOS (complementary metal
oxide semiconductor) that uses separate bus for instruction
and data which allows simultaneous access of program and
data memory. The main advantage of CMOS and RISC
combination is low power consumption resulting in a very
small chip size with a small pin count through this can
reduce the area. The main advantage of Complementary
MOS is that it has immunity to noise than other fabrication
techniques. Various microcontrollers offer different kinds
FLASH is the most recently developed technology that is used in pic16F877A is flash technology, so that data is retained even when the power is switched off, like permanent storage. User can easily Program and Erase the unwanted data are other features of PIC16F877A. Figure 4 shows the complete Schematic of the proposed system.

PIC16F877A used in this proposed system due to its properties. High-performance RISC CPU, low power consumption. Operating speed: DC - 20 MHz clock input DC - 200 ns instruction cycle up to 8K x 14 words of Flash Program Memory, Interrupt capability (up to 14 internal/external). Eight level deep hardware stack. Power-on reset (POR), power-up timer (PWRT), Oscillator Start-up Timer (OST), watchdog Timer (WDT), RC Oscillator for reliable Operation, Programmable code-protection, Power saving SLEEP mode, selectable oscillator options, low-power, high-speed CMOS EPROM/EEPROM technology, fully static design. In-Circuit Serial Programming (ICSP) via two pins. Only single 5V source needed for programming capability. Processor read/write access to program memory. Wide operating voltage range: 2.5V to 5.5V. High Sink/Source Current: 25 mA. Commercial and Industrial temperature ranges.
V. EXPERIMENTAL RESULTS

All the part of Sensor algorithm is successfully verified by the simulation as well as deployment. If no detection occurred sensor will be in the low state. If any detection occurred, all doors will be closed and vehicle theft identified. Sensor state will be in high state. Fig 3 shows status of door sensor if no detection occurred. Fig 4 shows status of door sensor when detection occurred.

![Figure 3 Door opened](image)

![Figure 4 Door closed](image)

![Figure 5 password authentication](image)

If any person needs to use the vehicle, person must enter the proper password. If the password is wrong controller issues command to engine motor to reduce the speed gradually and shut down the engine motor. When the password is matched, locking system will be in the disabled mode and user can handle the vehicle. Interruption occurs in any sides of the doors all the doors will be in locked mode. Fig 5 and fig 6 showing the password authentication and the status of system when password is correct. Fig 7 shows the engine motor status when password is matched.

![Figure 6 Password is correct](image)

![Figure 7 engine motor if password is correct](image)

![Figure 8 Enabling of locking system](image)

![Figure 9 Engine motor if password is wrong](image)

Fig 8 showing the enabling of locking system and fig 9 shows the corresponding engine motor status. Motor speed is gradually decreasing and last it will be in turned off position.

Tracking system will be always in the active mode. In a particular time interval monitoring centre get the position status of vehicle by the help of GPS.
and GPRS/GSM. Fig 10 shows the enabling of the tracking system and fig 11 shows the Position status of the vehicle.

Figure 10 Vehicle tracking system

Figure 11 Position Status of the vehicle

VI. CONCLUSION

In this proposed method of vehicle tracking and locking systems used to track the vehicle, Track the theft vehicle and also gives protection to our vehicle by using GPS and GSM/GPRS technology. The locking system puts into the sleeping mode when vehicle handled by the owner or authorized persons; otherwise goes to active mode. The mode of operation changed by person or remotely. When the theft identified, microcontroller issues the control signals to stop the engine motor. All the doors will be locked according to the interruption occurs in the sides of the doors. To open the doors or to restart the engine authorized person needs to enter the passwords. In this method, easily track the vehicle place and provide protection to the vehicle through GSM/GPRS.

VII. FUTURE SOPE

When the system is designing for industries we can implement the higher level logic based on cloud computing infrastructure. The sensors are used to monitor the fuel level, driver conditions, and speed of the vehicle. All the data transferred to cloud server using GSM enabled device. All the vehicles equipped with GPS antenna to locate the place. To avoid the drunk and drive, the alcohol sensor installed to monitor the driver status. The proposed technology significantly avoids the accident in highways.

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