V-Pro

Vehicle Protection System

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Abstract: Cars are an important amenity and also they are very expensive. Even the parts removable from outside such as rims, mirrors, wipers, etc. can cost you a dime. Though, today's cars are equipped with buzzers but it is of no use if the person is not nearby. In addition to that many people don't have proper parking space near their home. Car stealing is nowadays a common problem and in addition to that some other parts of the car which are removable from the outside can also get stolen. Many of these parts as well as cars cannot be tracked. Cars inbuilt security system works to keep cars safe from theft, but these options are useless once your car is stolen. Keeping all this in consideration we are trying to build a project which can help you to track your car's real time location. Also we need the system where vehicle automatically informs the user via phone call directly on user's GSM phone. As soon as someone tries to tamper with the vehicle, system will automatically generate a phone call on user's phone. User will then take necessary action for the vehicle. Another advantage of system is that the user is always reachable by vehicle security system.

I. INTRODUCTION

V-Pro is vehicle protection system which can inform you security related information of our vehicle in real time. Car stealing is nowadays a common problem and in addition to that some other parts of the car which are removable from the outside can also get stolen. Many of these parts as well as cars cannot be tracked. Cars inbuilt security system works to keep cars safe from theft, but these options are useless once your car is stolen. V-Pro sends you security information of robbery in progress as well as if vehicle is already being stole. Over monitoring your vehicle, you can also control some of the features to stop robbery according to your will.
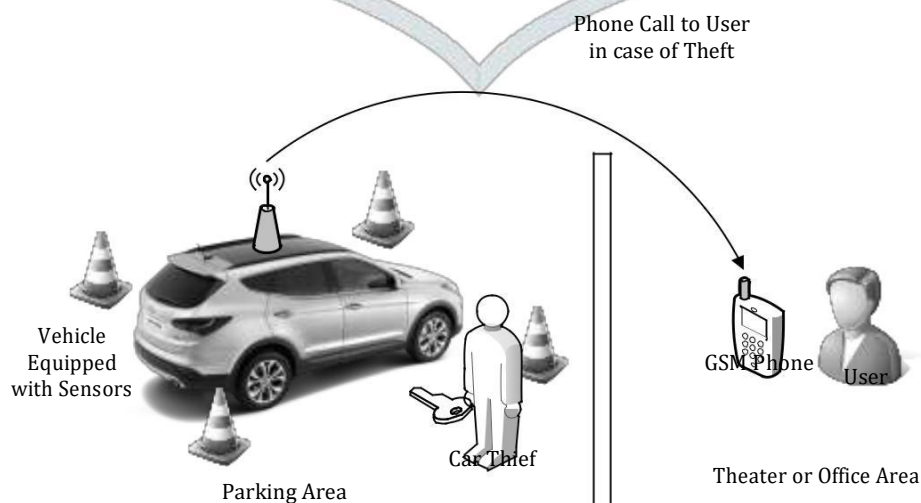
Fig: Basic working model of V-Pro

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II. LITERATURE REVIEW

Car security is the major concern now a day's. Car manufacturers try to modify security system by implementing different technologies. Currently central locking system and also theft detection system is available in the vehicle these can alert car owner for theft detection. But these methods by car manufacturers are limited to the distance i.e. owner must be available in the specific radius of vehicle to hear or react to the situation, and generally the distance should be very low in such conditions to perform any action.

Existing system falls back when it comes at the point of distance between owner and the vehicle. Traditionally only buzzers act as the primary theft detection system, owner can only know about robbery when he/she is near to the vehicle at a hear able distance. Owner does not have the ability to react in such situations remotely. It is mandatory for vehicle owner to be present near vehicle to stop the robbery in progress.

Basic idea behind the project is to implement the car security system using GSM technology. Proposed system will be able to control user car or any vehicle using GSM based SMS service and Call service as a communication media where at both end users need a GSM based modem or phone. Consider a condition if user come to know that his vehicle is not there where it should be. Then user can stop the car activities by sending some kind of predefined SMS to the system connected to the car and car will operate itself by switching off the car engine ignition system. And after it if user wants to know the location of the car then user can make a call to the car which will in return provides the exact co-ordinates of car via SMS on your phone.

III. PROPOSED WORK

To overcome the problems from the traditional system like remote access and lack of security features, "V-Pro" can be implemented. It provides a new upgrade to the manufactures originally embedded security system which only generate sound if anyone tampers with the vehicle.

Below diagram will show the basic block of the project. User first sends the formatted message to the car where this message is received by the GSM modem and transferred to the system and if command is to control the car engine then system will control the car engine as per the command send.
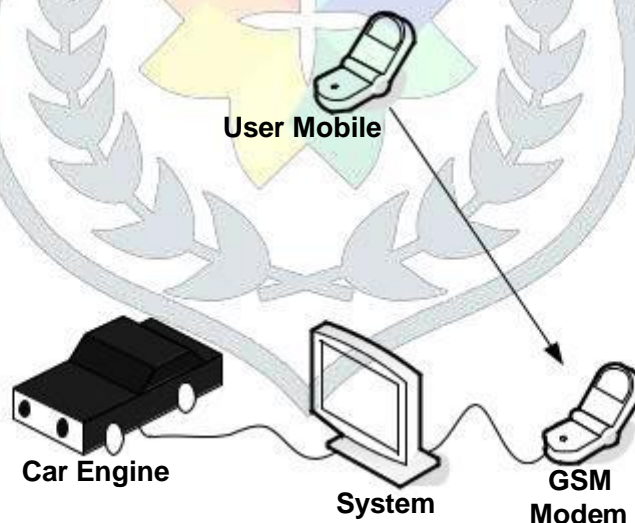

Fig: Modules of V-Pro

System contains following modules:
1. User Mobile: User Send message from this mobile to control the car.
2. GSM Modem: This is connected to the car so that user can send command to car. This device is reads incoming command in the form of SMS and then system takes action as per command.
3. System: This is the main command processor which will take command from GSM modem and then control the car engine.

The execution process is as follows, each process is for a specific situation which will or may occur during execution.
i. Steps perform when car robbery is in progress
  Step 1. If anyone tries to tamper with car, cars internal security system will generate a signal which is sent to IOMATIC board.
  Step 2. After receiving the signal from the cars internal sensors IOMATIC board generates a message and provide it to the user via SMS service and call service.
  Step 3. User can react according to the situation after receiving notification.

ii.   Steps perform when car is robbed:

Step 1. User will send a formatted message to the car i.e. IOMATIC board of the car.

Step 2. After receiving SMS, IOMATIC board will get triggered.

Step 3. IOMATIC board will sends an SMS to the user containing the co-ordinates of the car.

iii.   Steps perform to block ignition:

Step 1. User will send a formatted message to the car i.e. IOMATIC board of the car.

Step 2. After receiving SMS, IOMATIC board will get triggered.

Step 3. IOMATIC board will stop the ignition system of the car.

IV. IMPLEMENTATION DETAILS

ABOUT ARDUINO PLATFORM

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message – and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the micro-controller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.
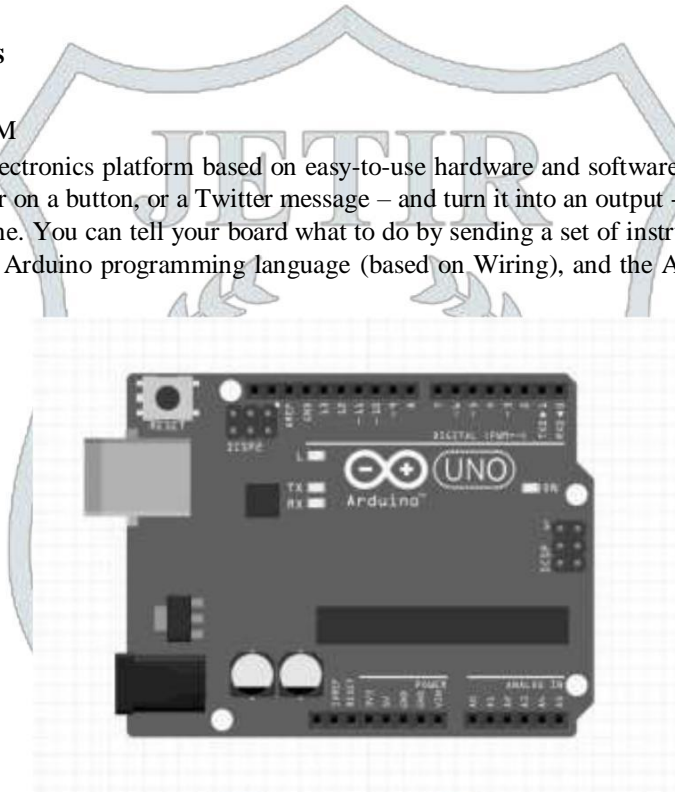

Fig: Arduino Board

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike. Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs. The software, too, is open-source, and it is growing through the contributions of users worldwide.

WHY ARDUINO?

Thanks to its simple and accessible user experience, Arduino has been used in thousands of different projects and applications. The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to build low cost scientific instruments, to prove chemistry and physics principles, or to get started with programming and robotics. Designers and architects build interactive prototypes, musicians and artists use it for installations and to experiment with new musical instruments. Makers, of course, use it to build many of the projects exhibited at the Maker Faire, for example. Arduino is a key tool to learn new things. Anyone - children, hobbyists, artists, programmers - can start tinkering just following the step by step instructions of a kit or sharing ideas online with other members of the Arduino community. There are many other microcontrollers and microcontroller platforms available for physical computing. Parallax Basic Stamp, Netmedia's BX-24, Phidgets, MIT's Handy board, and many others offer similar functionality. All of these tools take the messy details of microcontroller programming and wrap it up in an easy-to-use package. Arduino also simplifies the process of working with microcontrollers, but it offers some advantage for teachers, students, and interested amateurs over other systems:

- Inexpensive - Arduino boards are relatively inexpensive compared to other microcontroller platforms. The least expensive version of the Arduino module can be assembled by hand, and even the pre-assembled Arduino modules cost less than $50

- Cross-platform - The Arduino Software (IDE) runs on Windows, Macintosh OSX, and Linux operating systems. Most microcontroller systems are limited to Windows.

- Simple, clear programming environment - The Arduino Software (IDE) is easy-to- use for beginners, yet flexible enough for advanced users to take advantage of as well. For teachers, it's conveniently based on the Processing programming environment, so students learning to program in that environment will be familiar with how the Arduino IDE works.

- Open source and extensible software - The Arduino software is published as open source tools, available for extension by experienced programmers. The language can be expanded through C++ libraries, and people wanting to understand the technical details can make the leap from Arduino to the AVR C programming language on which it's based. Similarly, you can add AVR code directly into your Arduino programs if you want to.

- Open source and extensible hardware - The plans of the Arduino boards are published under a Creative Commons license, so experienced circuit designers can make their own version of the module, extending it and improving it. Even relatively inexperienced users can build the breadboard version of the module in order to understand how it works and save money.

IOMATIC IOT DEVELOPMENT BOARD

Now, no more need to use breadboards, jumper wires and tiny electronics components, to understand the Arduino programming. Just concentrate on programming and your application logic, rest will be taken care by IomaTic. IomaTic is first of its kind, complete IoT application development platform. It takes the ease of Arduino programming IDE and the power of open source Arduino Uno board, clubbed together with tons of on-board component and modules makes it perfect solution for the beginners who are willing to learn IoT and the experts who are ready to deploy IoT as applications or product. Unique Arduino and Atmega328p based development board having on-board components like SIM 808 with SIM slot, GPS, Bluetooth, ESP8266, DHT11, buzzer, 16x2 and 16x4 LCD support, and 30amp. Relay, serial interface, mini USB programming port, connectors for different configurable IOs, multilevel voltage out like 12v, 5v, 3.3v so you can connect any sensor directly to board, configuration DIP switches to control components or modules power state and LED indications for different modules.

To control these entire modules and to develop IoT applications, IomaTic board comes up with different sample codes and almost 40+ ready to deploy application where at single click IomaTic board can be converted in to real life applications that to free of cost. Finally, where all the beginners and developer stuck in IoT development is server, hosting, web services, data analysis, cloud storage or data push and pull services to interface IoT board or hardware with internet. IomaTic board comes up with complete range of web services and data analysis tools with bare minimum cost to launch your own IoT application.

- Personalize It: It's a most inexpensive IoT development board with various inbuilt on-board features.
- Perform It: Best for the industry support by Arduino IDE and extreme set of sample codes which are easy to code.
- Publish It: Using free to use web platform and data analysis tools you can go live like plug and play.

IOMATIC BOARD FEATURES

- Monitor and Control: Control all your devices, tools, systems, machines and everything that you want to control remotely just at a single click. Using the latest protocols and tools monitor all your devices, sensors and equipment through web and mobile version of data analysis software.

- Track and Communicate: With the help of on board GPS and tracking web platform user can track all your assets. Wide range of communication starts from serial, GSM, GPRS, Bluetooth to Wi-Fi.

- On-Board: Temperature, humidity, LCD, Buzzer, Relays, Digital IO ports, ADC ports, multi-level voltage out, Configurable Dip Switches gives you freedom to build your power application.

- Software Support: IomaTic comes with data push web service, data analysis web application, product manageable dashboard and finally the control and monitor mobile application with cloud based data storage.

- Arduino IDE support: Well-known and best in class Arduino IDE support makes it easy to code, manage and develop applications with existing world-wide support.

- Sample Source Codes: IomaTic provides user not just a sample source code but a wide range of ready to use applications.

V. RESULT

The Vehicle Protection System aims to reduce the number of robbery occurred in our day to day life. In addition to that it will create a safe environment for vehicles and will provide peace to user's mind after parking vehicle in any unknown site.

VI. CONCLUSION

Human being are mainly concern about the valuable things which they belong like home, vehicles, cellphones, money. So by developing proposed system we are trying to accomplish task of protecting users vehicle and providing alerts notification at critical times.

More controlling options can be provide in future like controlling whole system via android or iOS mobile application instead of manual ways like call and SMS. Owner can get more detail information about the system and vehicle health in form of message or notification in mobile application. Cars internal view can be view on mobile devices through internal cameras installed inside the car.

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