

## Design of a Car Engine Control System Using an Online GPS Tracking Website

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### ABSTRACT:

This paper proposes a Car Engine Control System using GPS Technology, Navigational Application Programming Interface and Google Application Programming Interface to provide cost effective solution for users in case of theft. An efficient tracking system is designed and implemented for continually monitoring car's location. Users will be able to track a moving car using an access to a website and control the engine supply of the car. The website will also allow a user to access car location from a database and monitor it on Google Maps. In order to show the feasibility and effectiveness of the system, this paper presents the experimental results of the car tracking system.

**KEYWORDS:** Car Engine Control, Website design, GPS, Navigational API, Google API

### INTRODUCTION:

Security is the prime concern for everyone. Nowadays all the auto motives are equipped with auto cop systems. Even though, the thieves are breaking the barriers and stealing the vehicles.

There are various electronic equipments available for remote operation of device control. However, the main disadvantage of these systems is that they can be operated only from short ranges and also less reliable. Thus, this project uses one of the wireless communication technique i.e., GSM (Global System for Mobile communications) to overcome these drawbacks. It is a digital cellular communications system which has rapidly gained acceptance and market share worldwide.

If the vehicle is stolen, the owner can continuously track the status of its position on an online website using GPS technology. A relay will be used to control the power supply of the car engine. For security purposes, more than one relay can be used. HTML, PHP and SQL will be used to write commands for the website to switch the relay ON and OFF. Once the relay is switched ON, the power supply to the car is cut off and the movement of

vehicle stops. The vehicle can only be ignited back if the relay is switched off.

A camera can be installed for the recognition of the thief for further added security.

### ARCHITECTURE OF THE TECHNOLOGY:

#### Microcontroller PIC18F2550



**Fig. 1: Microcontroller PIC18F2550**

PIC is a family of modified Harvard architecture microcontrollers made by Microchip Technology, derived from the PIC1650 originally developed by General Instrument's Microelectronics Division The

name PIC initially referred to Peripheral Interface Controller.

PIC18F2550 is a 28 pin IC with 1K byte Dual Port RAM and 1K byte GP RAM, Full Speed Transceiver, 16 Endpoints (IN/OUT), Internal Pull Up resistors (D+/D-), 48 MHz performance (12 MIPS), Pin-to-pin compatible with PIC16C7X5.

### **GSM**

GSM (Global System for Mobile Communications) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocol for second-generation (2G) digital cellular

Networks used by mobile phones, first deployed in Finland in July 1991. As of 2014 it has become the default global standard for mobile communications - with over 90% market share, operating in over 219 countries and territories.

### **THE CODE FOR RETRIEVING THE LOCATION DATA HAS BEEN GIVEN BELOW FOR REFERENCE:**

```
<?php
```

```
$servername = "localhost"; $username = "root"; $password = "singhprashant"; $dbname = "MyGuests";
```

```
// Create connection
```

```
$conn = new mysqli($servername, $username, $password, $dbname); // Check connection
```

### **SYSTEM FLOW:**

#### **LITERATURE SURVEY:**

1. "Development of GSM based Vehicle Theft Control System" by B.G Nagaraja, an undergraduate student of East West Institute of Technology, Bangalore and his co-authors. The prototype project was an enhancement of the same.
2. "Tracking Vehicles with GPS", Jianyang Zheng, Yinhai Wang and Nancy L. Nihan

### **COMPONENT DEFINING:**

After analysing the need of this project, the work to be done was both Hardware and Software based.

The Hardware part includes the use of Microcontroller, Voltage Regulator, Step Down Transformer, Relays, Resistors, Capacitors, Crystal Oscillators, Transistors, GSM and GPS modules.

2G networks developed as a replacement for first generation (1G) analog cellular networks, and the GSM standard originally described a digital, circuit-switched network optimized for full duplex voice telephony. This expanded over time to include data communications, first by circuit-switched transport, then by packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for GSM Evolution or EGPRS).

The Software part includes the designing of the Website to track the position of the vehicle and Control the engine supply.

### **CODING:**

The coding part for the hardware has been done in C language on MIKRO C PRO and that of the website has been done using PHP and MySQL database and implementing it using HTML.

### **GPS:**

The **Global Positioning System (GPS)** is a space

based navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil, and commercial users around the world. The United States government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver. It provides all the whereabouts of the vehicle, traffic congestion, alternate routes available, etc

```
if ($conn->connect_error) { die("Connection failed: " . $conn-
```

```

>connect_error);
}
$latitudeandlong = "hello";
$sql = "SELECT id, firstname FROM MyGuests"
;
$result = $conn->query($sql);
if ($result->num_rows > 0) { // output data of each row

    while($row = $result->fetch_assoc()) { echo "id: " . $row["id"]. " - Name: "

.$row["firstname"]."<br>"; $latitudeandlong =

$row["firstname"];
        echo $latitudeandlong . "<br>";

    }
} else {

    echo "0 results";
}

echo "final" . $latitudeandlong . "<br>"; header("Location:
http://localhost/databasescript/e/insert.php?post=". $latitudeandlong);
$conn->close(); ?>

```

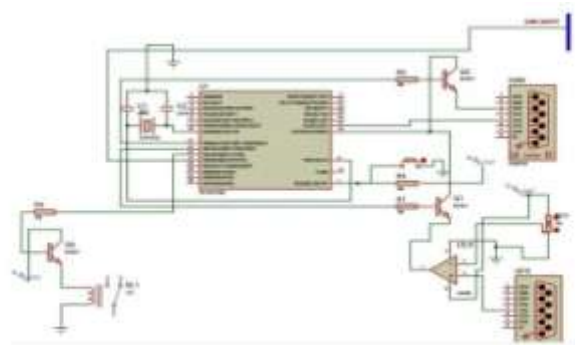
### PCB DESIGNING:

The virtual circuit for the project was designed on PROTEUS 8.1 Simulation Software. After programming the circuit, the simulation was successfully completed. The final design was then implemented on a Printed Circuit Board (PCB).

### RESULTS:

A system has been designed that would provide users with the current position of the vehicle by GPS using an online website. Also, the user gets to give commands to control the engine of the vehicle, both ON and OFF. Most importantly, it is an efficient anti-theft device which could be accessed by a common man.

### IV. PROPOSED IMPLEMENTATION PROCESS:



**Fig. 2: Hardware Circuit Diagram**

Here a Microcontroller PIC18F2550 has been used as the motherboard of the circuit. The Microcontroller works with a 5 Volts supply given to its first pin MCLR (Master Clear Reset).

The controller has been interfaced with a crystal oscillator. Crystal's role is to provide the basic system clock signal. Usually a system shares a single crystal, easy to synchronize the various parts. The frequency used for the oscillator will be 4 or 8(due to switching at Tx, Rx pins) Mhz. The controller is then connected to the GSM and GPS modules. The GSM module is used to act as an intermediate server between the website and the vehicle. GPS module is used for continuous tracking of the vehicle and reporting its coordinates online to the user. Switching has been provided at the Microcontroller pins 17 and 18 for sending and receiving signals from both the GSM and GPS. A Relay is connected to pin 23 of the controller. This Relay(s) shall be switched on to turn off the vehicle's power supply or the ECU.

### CONCLUSION:

This project can be used in personal cars, bikes and motorcycles to provide theft security. Also this system can be secretly installed in an Airplane to favour in case of a hijack.

It can also be implemented in public transport, be it buses, cabs, auto rickshaws or any other means. The project does not only serve the purpose of protecting the vehicle, but indirectly, also the person.

This paper proposes the design and implementation of our website tracking. The system helps owners to get the authority to stop the engine at a particular stop. It can also fetch ETA of a requested route and provide real time information to people, so that the thief could be caught. It will also make the public transport system competitive and passenger- friendly. However a few other important services can be provided via our website. We can provide owners several utility services such as online ticket booking, virtual account for payment portals, feedback for transport services, raise a SOS signal if in danger, planned journey, etc. This research has been completed under the guidance of Ms. Swati Sharma, Assistant Professor, SRM University. We are grateful to her for the insight and expertise that greatly assisted the research. We would also like to extend a heartfelt thanks to our Project Coordinators, Ms. Rupali Singh, Ms. Minakshi Sanadhya, Mr. Arun Kumar and the entire department of ECE for their constant support.

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