

# Advanced Secured Vehicle System with Iris Technology and Auto Speed

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**Abstract**— In this project to access the vehicle fistful we need to check the IRIS authentication in entry section. if the authentication is success then entry section sends the information to vehicle section to access the vehicle. The total equipment of the project placed in the vehicle. The authorized person details with mobile number and some predefined parameters are stored in the Microcontroller. Whenever we find that our vehicle is missing then simply send a SMS or a Missed-Call to GSM Modem from the authorized mobile after registering with the GSM modem. Then we can send a SMS to the modem to block the motor in the vehicle so that it can't move. In the project we have an accident detecting circuit which detects the accident occurred to the vehicle and gives this information to the controller. By using GPS latitude and longitude values we will track the location of the vehicle where the accident occurred and by using GSM we will send the message to the person whose number is predefined in the program about the accident location

In this project we have a zone section which is used to control the speed of any vehicle depending on the local speed limit. Every city, town or a village, can be marked and divided into individual zones. The division depends upon the area under which the business, residential, and industrial regions come under. Consider a city or town can be divided into physical zones which are classified according to different speed ranges. At every zone we have IR transmitter and Receiver at the entry and exit points. The information that the vehicle entered into the zone section is received by the RF module in the vehicle section from zone section by RF transmitter. If any vehicle enters into a zone the IR transmitter detects the vehicle and controls the speed of the vehicle according to the zone and when the vehicle exit from the zone the IR transmitter again detects the vehicle at the exit point, then the vehicle achieves its normal speed again. Thus the speed limit varies for different zones.

**Keywords**— IRIS Recognition, IR transmitter and IR receiver, RF transmitter and RF receiver, GSM modem, GPS modem

## I. INTRODUCTION

Automobiles have a great importance in our day to day life. It plays a vital role in consuming time but at certain places if there is any accident has occurred sometimes it gets difficult to find the exact location of the car, there could be a loss of life due to the delay in the arrival of ambulance or concern person on the spot, but in this project it is very easy to find the location of the accident and reach there at appropriate time. In this project we are going to use one clamper switch in front of a vehicle as the accident has occurred Micro controller will find the exact location of the vehicle using GPS module, and once the location is figured out it will send the message to the respective number through GSM modem.

Automatic Speed Control which is nothing but a vehicle automatically controls the speed of the vehicles at speed restricted areas such as school and hospital zone etc. The main

reason behind developing this project is to avoid accident of vehicles at speed limit zones and also to help the passengers to cross the road safely without facing any danger from high speed vehicles. Normally, the vehicle drivers not consider the passengers who crosses road in speed limited areas and drive their vehicles at high speed. So, now accidents are increasing in these areas. The traffic police control the traffic but they are not able to avoid the accidents completely. Because he can't keep an eye on the speed of every vehicles at all time in these speed restricted areas. To solve this problem we developed the proposed project, which not interrupts the vehicle drivers and controls the speed of the vehicles up to certain limit in these speed restricted zones.

In this proposed project, the speed of vehicles can be controlled by the RF communication method. When we are implementing this project, we have to attach transmitter in speed restriction zones and attach the RF receiver in the vehicle. When a vehicle enters this zone, then these transmitters will send continuous coded signal to those vehicle. The receiver in vehicle will receive those signals and then micro controller, which is attached inside the vehicle, will control the speed of vehicle automatically. When a micro controller receives the code signal then it will control the speed of the vehicle. To reduce the speed of vehicle up to a certain distance we placed transmitters, which transmit these codes. We can use these codes to control the accidents between vehicles and people in such zones. The main advantage of this project is very useful for the common people to walk safely in the roads of speed restricted roads and also drivers can ride their vehicles safely. Now a days thefts of cars has raised and we don't have any proper solution to this problem. We are having professional automobiles engineers, and also we are having professional thieves. Just by making one of the pin ground anybody can access any car to overcome with this we are going to use biometric solution. We are having different types of biometric solution such as palm, voice recognizer, DNA, IRIS recognition and many more. In this project we are going to use IRIS technology because of its uniqueness and there are many advantages like iris patterns remain stable from 6 month of age to death The probability of finding two people with identical iris patterns is considered to be approximately 1 in 1052(population of the earth is of the order 1010). So if the person is authenticated then only he/she can access the car it will definitely reduce the thefts of cars and also we could use it in any authenticated areas. Iris recognition involves Iris image acquisition and enhancement iris features extraction and verification. In this whole process we are going to use cumulative SUM algorithm.

## II. IMPLEMENTATION

The implementation of this concept consists of both Hardware and Software Approach.

**A. Hardware Approach**

This project consist of two sections one is vehicle section and the other is zone section, vehicle section is nothing but a robot consist of LPC2148 controller ARM as core. UART0 is interfaced with GSM modem and UART1 is interfaced with GPS modem. One LCD is interfaced to the micro controller. Two L293D motors have been connected to the back wheels of the robot. One Accident detection circuit is placed in front of a car and one RF receiver is connected to the micro controller through decoder.

**a) Vehicle Section**

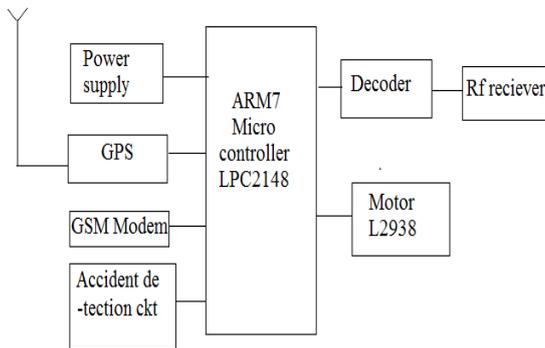


Fig. 1 Vehicle section

**b) Zone section**

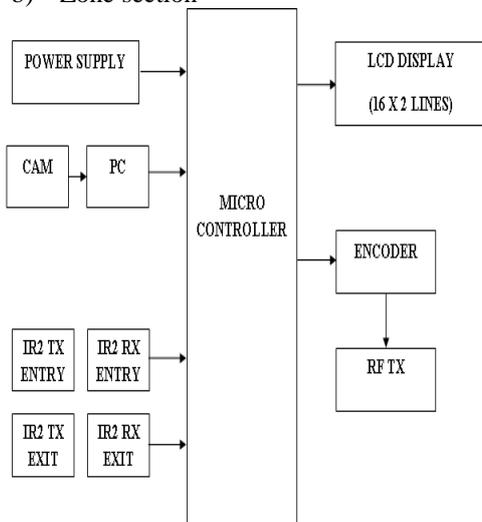


Fig. 2 Zone Section

Zone section consist of a controller LPC2148 with ARM7 core, this zone section consist of different kind of zones. Each zone is having one entry and one exit, Infrared transmitter (torch) and Infrared receiver(photo diode) are connected at the entry and exit point, this IR transmitter and IR receiver should be in line of sight so whenever an obstacle occurs between this transmitter and receiver it will make the respective pin of the micro controller low and micro controller will send a message to the robot through the RF transmitter once a message is received by the robot it will slow down the speed with the help of motors placed at the back wheels of the car. One LCD is interfaced with LPC2148 controller. UART0 of this Micro controller is connected with PC followed by Web cam, to

check weather the person is authenticated or not we are using IRIS technology. So to access the car the iris of the respective person should get matched with the iris in the data base.

**B. Software Approach**

The software approach consists Keil micro vision platform on the PC and the whole software is developed on the keil once we created a .hex file we dumped the code on the controller using Flash magic. Here we are also using IRIS technology the code is being generated on Matlab. The whole process will be like once the IRIS is matched the vehicle can be access.

In this IRIS technology we are going to use cumulative sum algorithm. This algorithm carries four steps as shown in the Figure 3

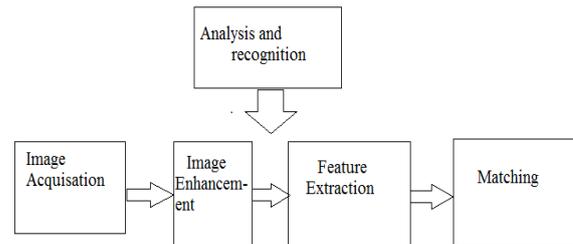


Fig. 3 Cumulative Sum algorithm

**III. EXPERIMENTATION**

In this paper if a person wants to access a vehicle his/her iris should get matched with the iris in the database. Firstly let us see what actually is Iris and how it looks like,

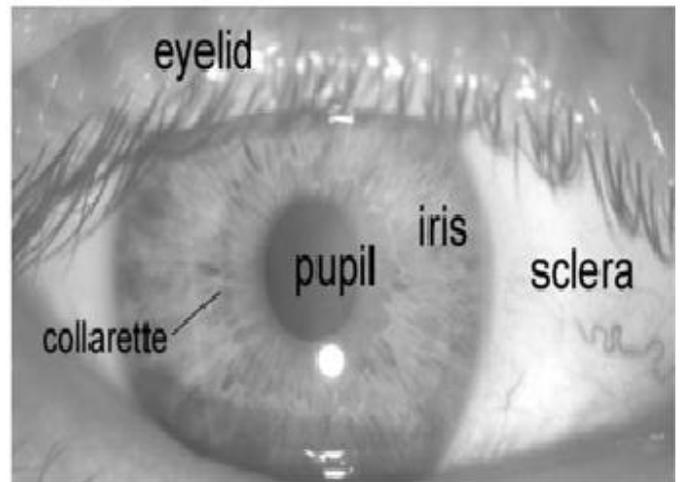


Fig. 4 Iris

The iris is a thin circular diaphragm, which lies between the cornea and the lens of the human eye. A front-on view of the iris is shown in Figure below. The iris is perforated close to its center by a circular aperture known as the pupil. The function of the iris is to control the amount of light entering through the pupil, and this is done by the sphincter and the dilator muscles, which adjust the size of the pupil. The average diameter of the iris is 12 mm, and the pupil size can vary from 10% to 80% of the iris diameter. The iris consists of a number of layers; the lowest is the epithelium layer, which contains dense pigmentation cells. The stromal layer lies above the epithelium layer, and contains blood vessels, pigment cells and the two iris muscles. The density of stromal pigmentation determines the color of the iris. The externally visible surface of the multi-layered iris contains two zones, which often differ in color. An

outer ciliary zone and an inner pupillary zone, and these two zones are divided by the colerete – which appears as a zigzag pattern. The probability of finding two people with identical iris patterns is considered to be approximately 1 in  $10^{52}$  (population of the earth is of the order  $10^{10}$ ). Not even one-egged twins or a future clone of a person will have the same iris patterns. The iris is considered to be an internal organ because it is so well protected by the eyelid and the cornea from environmental damage. It is stable over time even though the person ages. Iris recognition is the most precise and fastest of the biometric authentication methods. In this whole iris process first an iris image is extracted from an eye then it will be normalized and then using Hamming distance iris matching takes place. As shown in the below figure

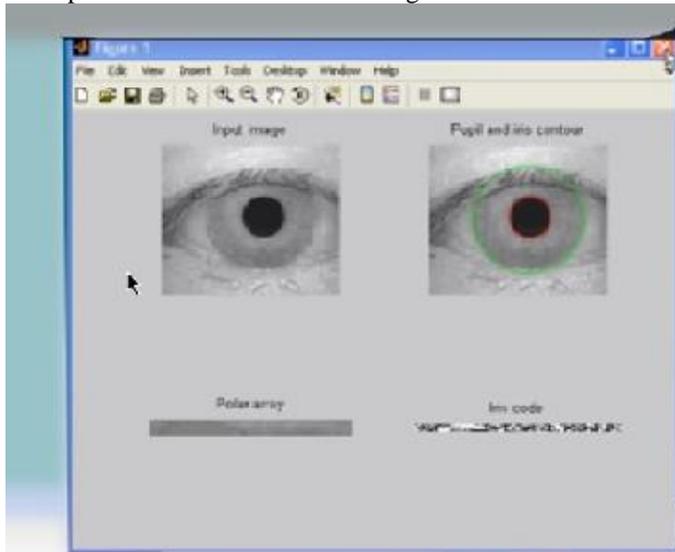


Fig.5 Iris image 1

This figure-1 Iris code is extracted using hamming distance and is comparing with the Iris code of figure 2 as show in the below figure 6, If both the figures are matched then vehicle can be accessible.

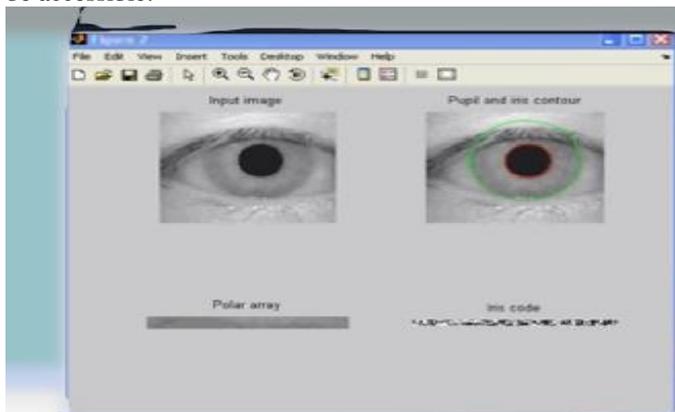


Fig.6 Iris image 2

Total code is written in C language on Kiel platform and once it is compiled it will directly dumped using Flash magic as shown in the below figure 7

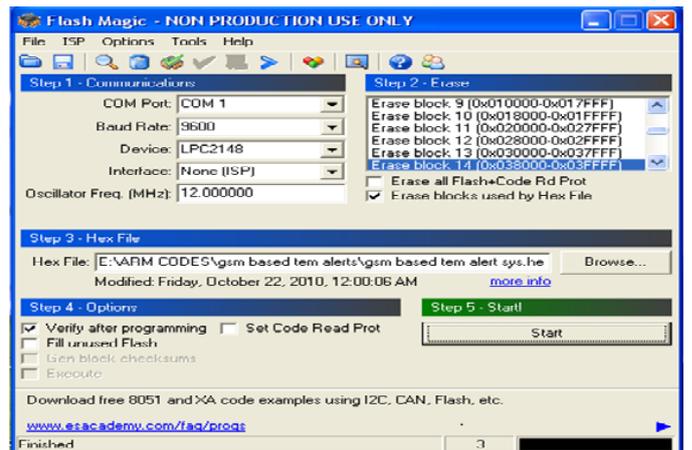
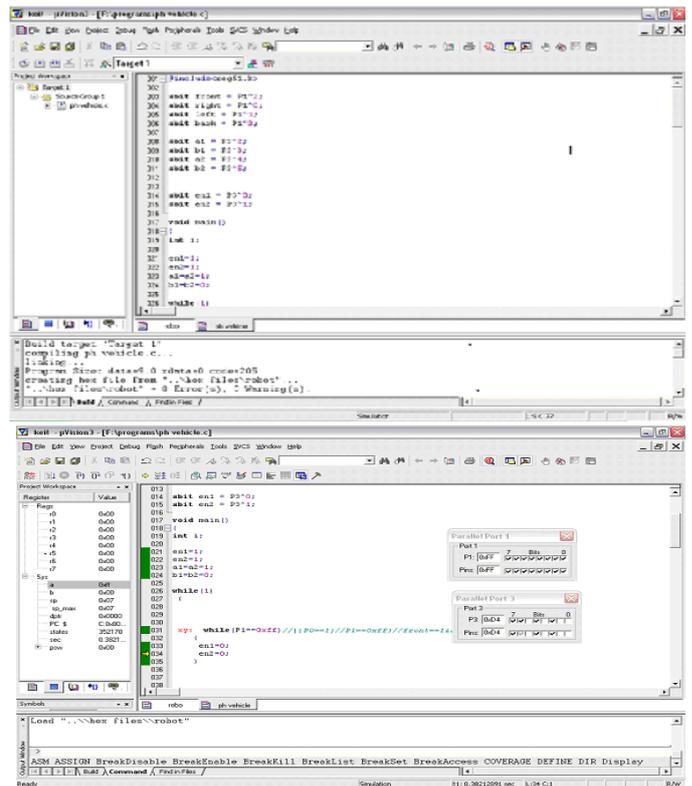


Fig 7 Coding and Dumping process

#### IV. SIMULATION RESULTS

We made this Graphical user interface using matlab coding, the first step of this is to browse the image and check it with the image in the data base. If the browse image and the image in the data base are equal then it mean that the person is authenticated and he /she can access the vehicle As shown in the below figure.

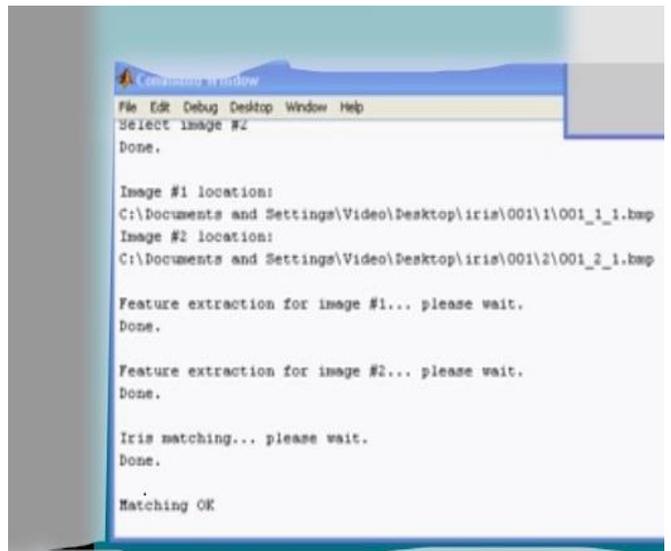
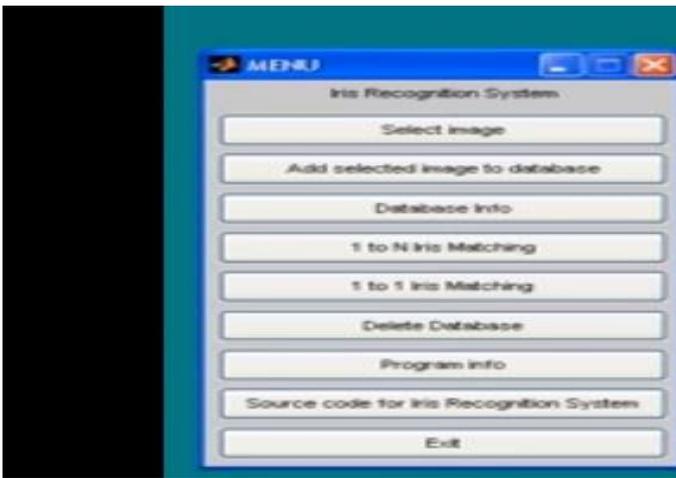
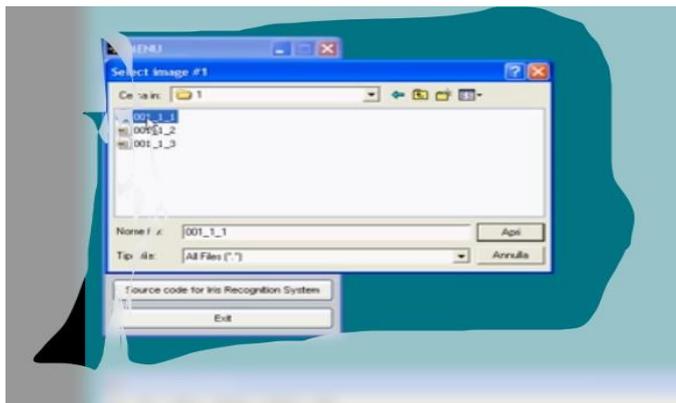


Figure 9 Iris Matching



Below figure shows the Transmission and reception circuit

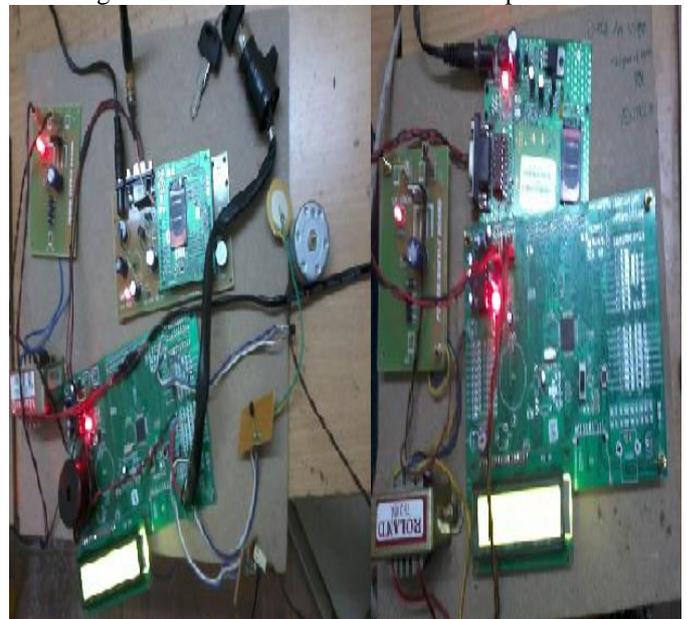


Fig 10 transmitting and receiving section

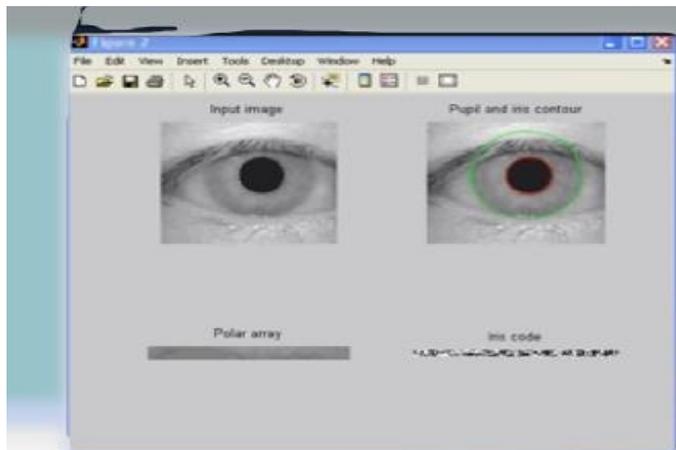


Fig 8 Iris imaging & Normalizing.

Now the other application is an accident detection, For an instant if accident has occurred probably the clamper switch has pressed, once the switch is pressed directly GPS will find the location of vehicle by itself and send a message to the respected number, and it also displays that on LCD as shown in the below figure.



Once both browse image and the image in the data base are matched it will show matching OK in the terminal as shown in the below figure 9

Fig 11 Accident detection

## V. CONCLUSION

The project "Advanced Secured vehicle system with Iris Technology and auto speed control" has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit.

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