

## REAL TIME VEHICLE THEFT IDENTITY AND CONTROL SYSTEM BASED ON ARM 9

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**Abstract :-**Due to the insecure environment the ratio of vehicle theft increases rapidly. Because of this manufacturers of luxury automobiles has the responsibilities for taking steps to ensure the authorization for the owners and also in built the anti theft system to prevent the vehicle from theft. The proposed security system for smart cars used to prevent them from loss or theft using Advanced RISC Machine (ARM) processor. It performs the real time user authentication (driver, who starts the car engine) using face recognition, using the Principle Component Analysis (PCA) algorithm. According to the comparison result (authentic or not), ARM processor triggers certain actions. If the result is not authentic means ARM produces the signal to block the car access (i.e. Produce the interrupt signal to car engine to stop its action) and inform the car owner about the unauthorized access via Multimedia Message Services (MMS) with the help of GSM/GPRS modem. Also it can be extends to send the current location of the vehicle using the GPS modem as a Short Message Services (SMS).

**Keywords:** -Advanced RISC Machine (ARM), Reduced Instruction set Computing (RISC), Multimedia Message Services (MMS), Principle Component Analysis (PCA), Short Message Services (SMS).

### I.INTRODUCTION

Many people make the mistaken assumption that car theft only occurs in seedy areas of town, but car theft can occur anywhere from an urban area to a suburb. People need to be careful not to entice thieves by making common mistakes. Theft is one of the most common and oldest criminal behaviors. Where the ownership of a physical possession can be altered without the rightful owner's consent, theft prevention has been introduced to assert the ownership whenever the rightful owner is physically absent. An anti-theft system is any device or method used to prevent or deter the unauthorized appropriation of items considered valuable.

### II. PROPOSED SYSTEM

#### 2.1 Overview of the Project

In our project, we propose extendable emergency response system for smart car to prevent them from loss or theft using Advanced RISC Machine (ARM) processor (RISC means Reduced Instruction Set Computing). In this method, the Face aDetection Subsystem (FDS) aims at detects somebody's face (who try to access the car). By using PCA algorithm we can get the common Eigen values of the person and it compares the image by finding the nearest value in some mathematical form which as like a function. If the person matches vehicle starts or owner will get MMS and GPS values of the vehicle location as SMS.

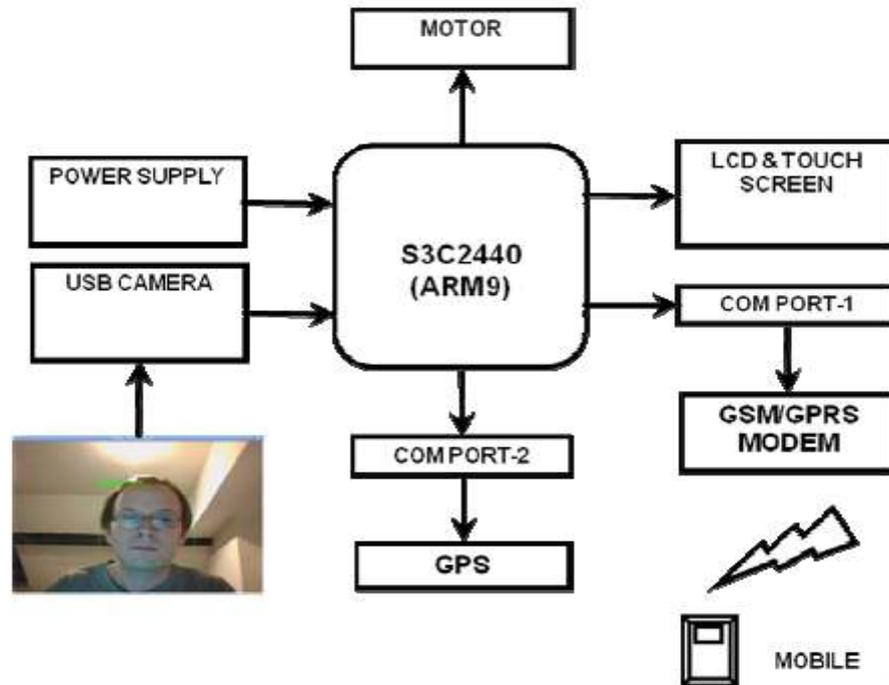
#### 2.2. Face Detection System (FDS)

Face is one of the most acceptable biometrics - based authentication methods, because of its nonintrusive nature and because it represents a common method of identification used by humans in their visual interactions. This algorithm extracts face portion alone from the photo taken by a webcam. At first, we get the location of the eye pair easily due to brighter pupil effect. After the location of eye pair, we can easily clip the face area from the input image according the spatial relationships between eye pair and face.

#### 2.3 Principle Component Analysis (PCA)

The purpose of PCA is to reduce the large dimensionality of the data space (observed variables) to the smaller intrinsic dimensionality of feature space (independent variables), which are needed to describe the data economically. The main idea of using PCA for face recognition is to express the large 10 vector of pixels

constructed from 15 facial images into the compact principal components of the feature space. This can be called Eigen face Projection.



**Fig.1: Block Diagram of Proposed System**

#### 2.4. Embedded Control System

The ARM is a 32-bit Reduced Instruction Set Computer (RISC) Instruction Set Architecture (ISA) developed by ARM Holdings. It was known as the Advanced RISC Machine, and before that as the Acorn RISC Machine. The relative simplicity of ARM processors made them suitable for low power applications. This has made them dominant in the mobile and embedded electronics market as relatively low cost and small microprocessors and microcontrollers. Following is the Mini 2440 board.

#### 2.5.GPRS/GSM Module

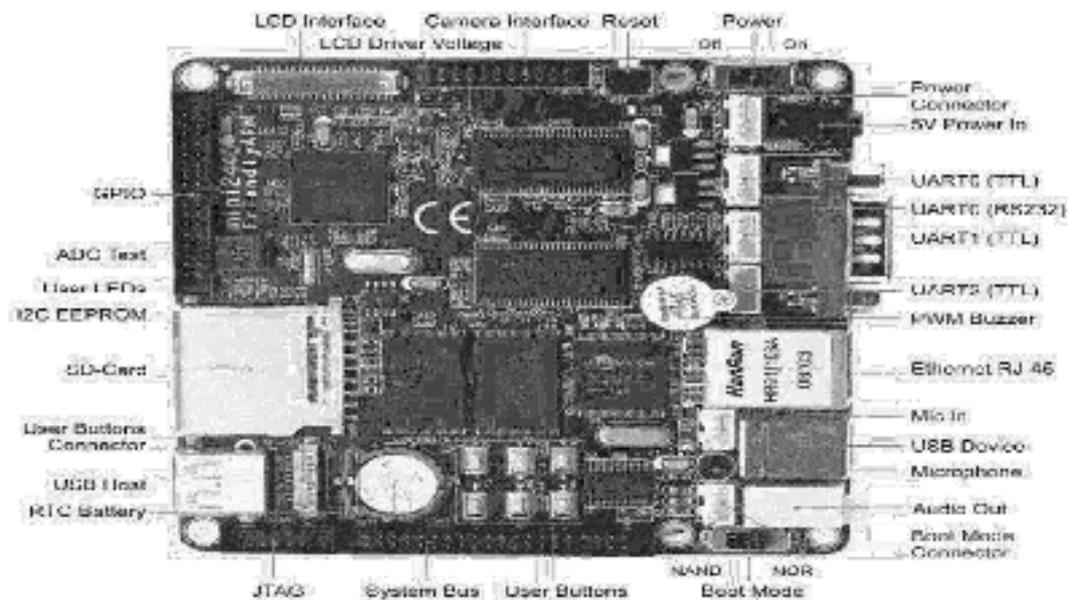
A GSM module is a wireless modem that works with a GSM wireless network. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages.

#### 2.6.GPS Module

The Global Positioning System (GPS) modem is the receiver that collects data from the satellites and computes its location anywhere in the world based on information it gets from the satellites. It provides reliable positioning, navigation and timing services to worldwide users on a continuous basis in all weather, day and night. The capabilities of today's system render other well-known navigation and positioning "technologies" - namely the magnetic compass, the sextant, the chronometer, and radio-based devices - impractical and obsolete.

#### 2.7. Motor

In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel. The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion.

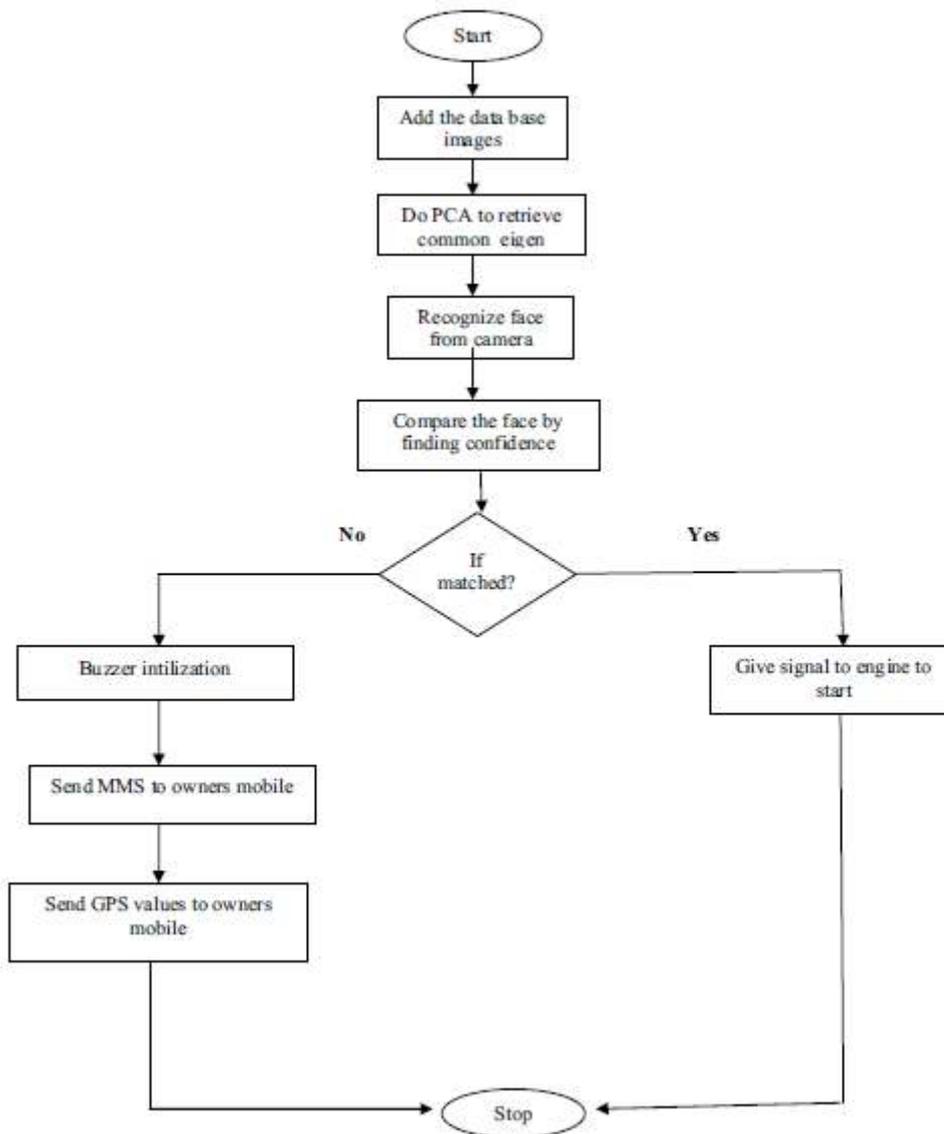


**Fig. 2. Mini 2440 ARM9 Board**

### 2.8 Algorithm for Proposed System

The working of the project can be explained in the following steps :

1. Initially switch ON the power supply for boards ARM9, GPRS and GPS.
2. Capture the image from the camera.
3. Then save the image.
4. Like this capture and save the image for 15 times.
5. From 15 images retrieve the common Eigen values.
6. Store generalized Eigen values in XML file.
7. Now click on the recognize button.
8. Then it compares the Eigen values of the face.
9. If the image matched, start the motor.
10. If not matched buzzer initialized and send MMS of the face.
11. Send GPS values as SMS.



**Fig. 3. Flow Chart of Proposed System**

Fig 4 shows the screen short after the collection of the gallery images. Then any person getting in to the carry it will compares if matched motor will starts i.e it will signal to the car to start otherwise the unauthorized person image will send as MMS to the owners mobile which shows the below figure 5.

### III. EXPERIMENTAL RESULTS

In this project, the real time face recognition is performed by using the PCA method with the help of web camera.

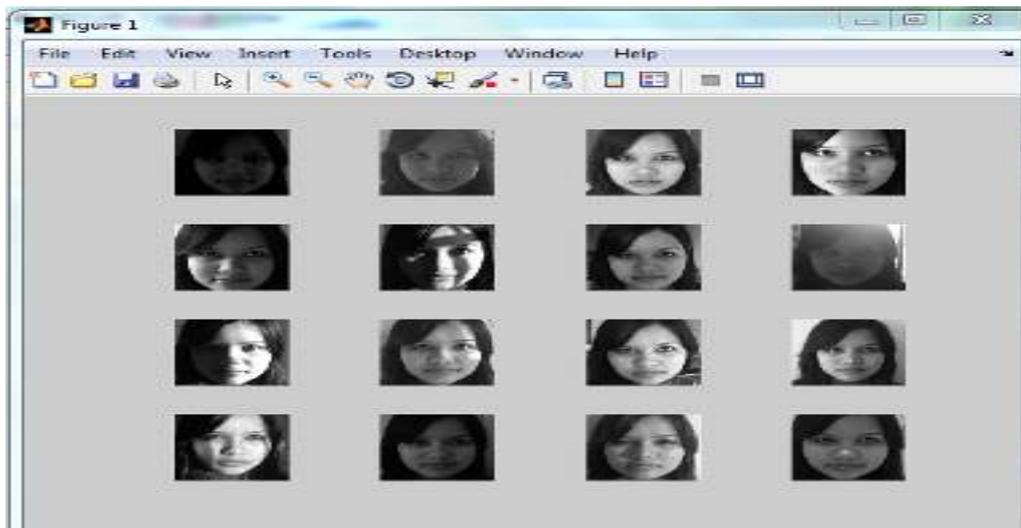


Fig. 4. Gallary of Database Images

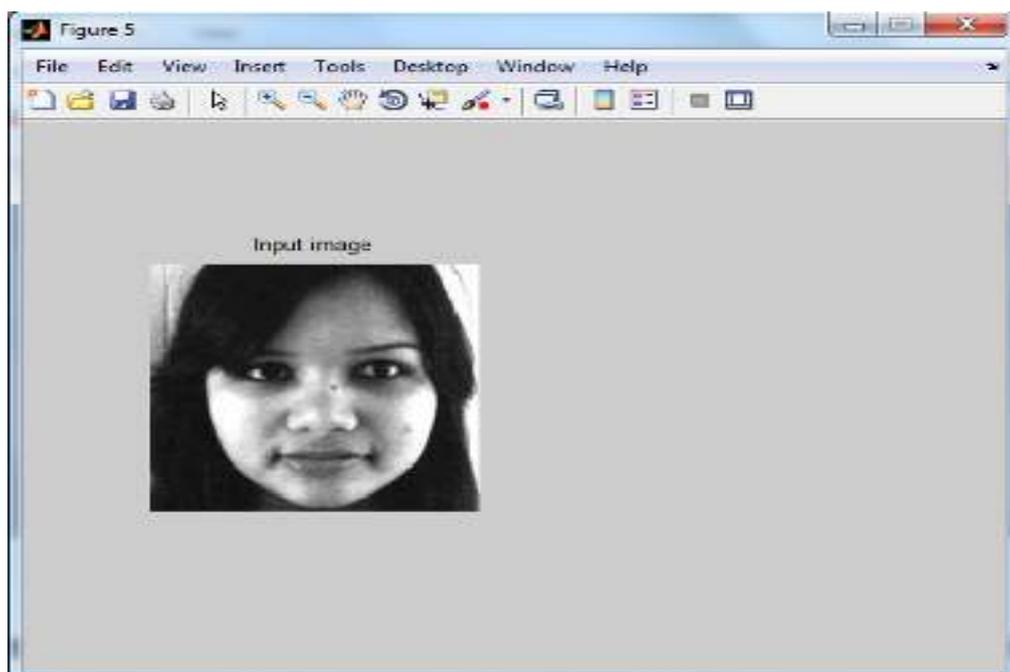


Fig. 5. Input Image

#### IV. CONCLUSION

In the present method the camera captures owner's image only. If the owner's relatives or friends want to start the vehicle it will not start. To overcome this one, we can extend this project by storing multiple faces into the memory. If any person wants to start the vehicle, the camera compares the person's image with the all stored images. If the result is matched the motor will start otherwise, the unknown person's image will go to the owner's mobile. In the current project if the results are unmatched, the unknown person's image will goes to

owners mobile only. In future we can extend this by sending the information to police control room for taking immediate action.

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