REVIEW ON FACE DETECTION AND RECOGNITION BASED VEHICLE ACCESSING

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Abstract :
The main aim of this project is to offer advance security system in car, which consist of a face detection system, a GPS module, a GSM module and a control platform. A GSM module and a control platform. The program is mainly used to notice the thief who is trying to thieve the car. FRS (Face Recognition System) is used to notice the face of the driver and compare it by the entire portfolio. The GSM plays a significant role in this system. FRS compares the obtained approach by all of the predefined approach if it matches once the engine automatically turns on and if the approach doesn' t match, then the engine won' t start on and the evidence is sent to owner at the hand of SMS that notable is disturbing to thieve the car. So now owner can receive the approach of the thief in database as the system will store the illegal person' s approach and can handle that image for besides investigation. This face detection system uses the optimized LBP (Local Binary Pattern) algorithm and detects the face of the users suitably in the real anticipate and makes a tip for the unsuitable user.

Keywords : LBP, Face recognition system, SMS GSM, GPS, Vibration Sensors, ATMEGA16.

1.1 INTRODUCTION

In this modern age there is rapid increase in number of vehicles and so is the number of car theft attempts, locally and internationally. With the invention of strong stealing techniques, owners are in fear of having their vehicles be in stolen from Page common parking lot or from outside their home. Thus the protection of the vehicles from theft becomes important due to insecure environment. Real time vehicle security system based on computer vision provides a solution to this problem .The proposed system is used to detect the image of the thief and it controls the operation that is start and stop operation. Thus the control is performed with the help of GSM. In the car one GSM module is placed where one SIM inserted into that module. This module is performing the control over the car only with the owners SIM number. When the owner recognizes that the car was lost. Then he can able to lock the door, capture the image of the driver and stop the car. The location of the car is detected by the GPS module and transfers the location to the owner' s mobile with the latitude and longitude specification. So that the car theft is controlled easily. With ARM7 as the core, the new intelligent vehicle security system integrated a lot of hardware modules such as video capture, GPS positioning and wireless transmission, the design of the system software used the embedded software developing platform on. By the hardware/software co-design, the new intelligent vehicle security system implemented the functions of video capturing, GPS positioning and wireless transmission, met the needs of vehicle owners about Vehicle Security.

Literature survey:

1. Real Time Vehicle Security System through Face Recognition
C. Nandakumar, G. Muralidaran and N. Tharani

Thus the protection of vehicles from theft becomes important due to insecure environment. Real time vehicle security system based on computer vision provides a solution to this problem. The proposed vehicle security system performs image processing based real time user authentication using face detection and recognition techniques and microprocessor based control system fixed on board with the vehicle.

2. **Automobile Security System Based on Face**

V. Balajee Seshasayee and E. Manikandan

In this proposed embedded automobile security system face detection system (FDS) is used to detect the face of the driver and compare it with the predefined face. In the night when the vehicle owner is sleeping and someone has theft the vehicle, then FDS obtains the images by one tiny webcam which can be hidden in the steering. FDS compares the obtained image with the predefined if the image doesn't match, then the information is sent to owner through MMS.

3. ADVANCED VEHICLE THEFT SECURITY SYSTEM USING CAN   TECHNOLOGY

Kamal Batcha M , Mohaideen Basha A Kamal Batcha M , Asik Ahamed , Nandakumar.

An economic security system against the theft of vehicle has been proposed in the work done. It involves a vehicle with perfect economic security system which ensures the prevention of vehicle theft and even if the vehicle is stolen, it gives us the location where the vehicle is being held on the owner's request by using GPS which enables tracking the location of the vehicle. In addition to the security system certain features are added to increase the Safe operation of the motor vehicle.
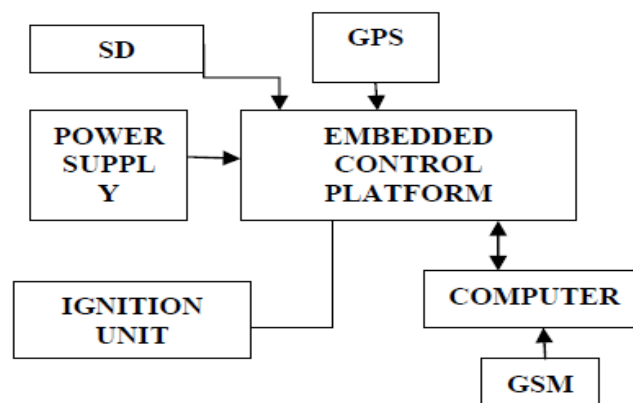
Research methodology:

fig. Block diagram smart security system

Working: In the car alarm system the main disadvantage is that it has limited   range .In GSM and GPS based security system has the drawback of SMS sending failure due to network error. The car security system using Image processing avoids the drawback by providing the information which is in the form of image of that susceptible person. Thus, the owner get this image via on Email or SMS .Additionally, the car owner can remotely control any of the car feature any time at anywhere via a phone call. This system introduced and desc ribes the design of mobile controlled car security system offering higher level of car security features with the information of thieves. In our   project for security purpose we use „ Image Processing" concept. When any known/unknown person sited in the car at drivers place, switch will gets press and controller will detects the signal and it send signal(character a)to laptop using USB to TTL .Microcontroller pin is connected to receiver pin of USB to TTL. In laptop we made a MATLAB_GUI. When signal is receive on comport of laptop, the camera of laptop will gets ON. It will capture the image and store it in laptop anywhere, and will send that image (known/known) to owner"s Mail ID. As the owner knows the status of the car through Mail, if the driver is unknown then it will make a simple call to another mobile which is placed in the car. Call will automatically receive. If the owner wants to stop the car, it will press „1". This signal is detected by DTMF circuit.MT87 is a „Dual Tone multi frequency" which is used as decoder. It decodes the signal and produce 4-bit digital output. The output of DTMF is connected to port A of the controller. When owner press „1" decoded by DTMF IC and gives to controller and gives to relay to lock the Fuel lock.
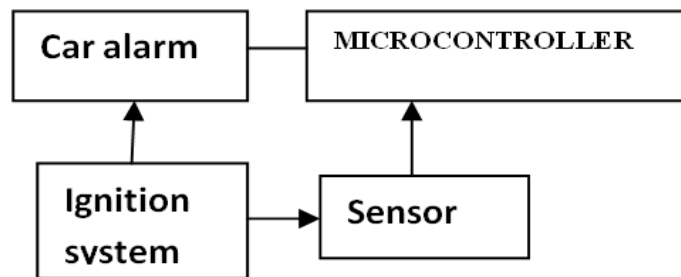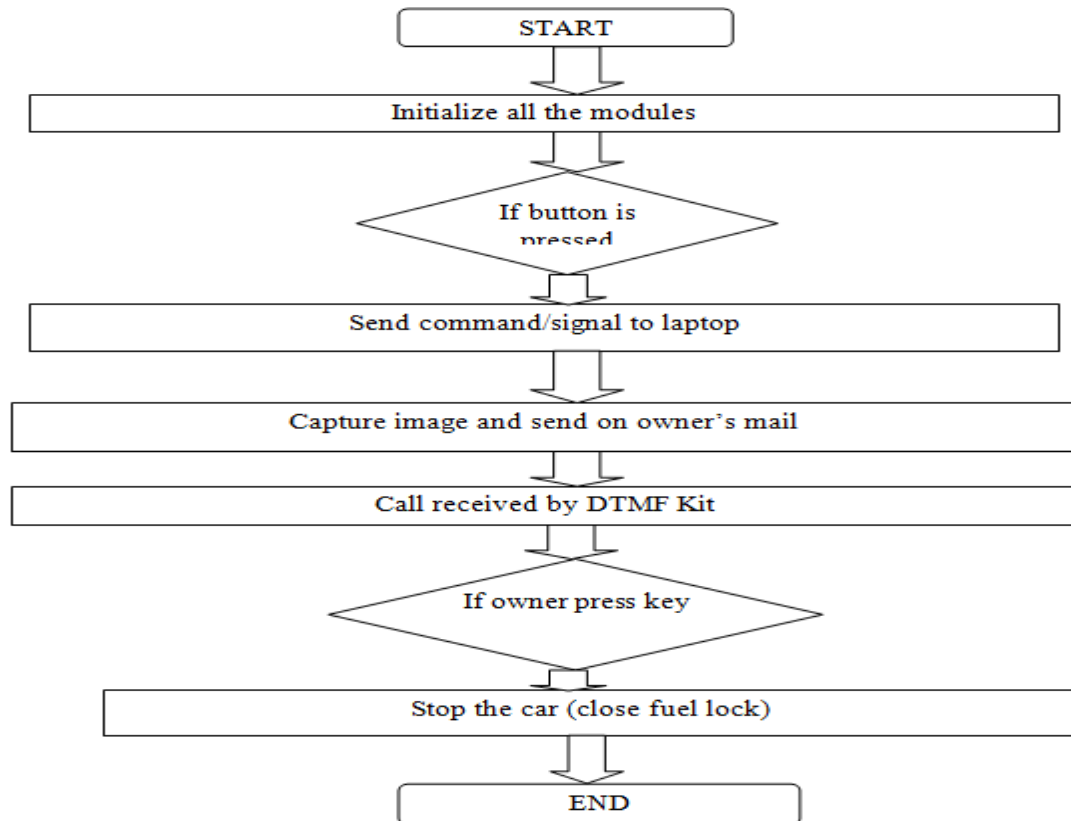
fig. Block diagram of the existing system

Fig. Flow chart of face detection and recognition based vehicle accesing with SMS and GPS

Component list :

Digital image processing: Digital image processing is the use of computer algorithms to perform image processing on digital image It allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and signal distortion during processing.

The control system: In these days, automobile thefts are increasing at an alarming rate all over the world. So to escape from these thieves most of the vehicle owners have started using the theft control systems. The commercially available anti-theft vehicular systems are very expensive. Here, we make an attempt to develop an instrument based on 8051 microcontroller and operated using GSM technology. The instrument is a simple and low cost vehicle theft control embedded system.The Global System for Mobile communications (GSM) is the most popular and accepted standard for mobile phones in the world established in 1982 and it operates in 900 MHz frequency. Over billion people use GSM service across the world. The utility of the GSM standard makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs significantly from its predecessors in both signalling and speech clarity, as its channels is digitized. It means that the GSM system is now considered as a third generation (3G) mobile communication system.

Face detection: Face detection is a computer technology that determines the locations and sizes of human faces in arbitrary (digital) images. It detects facial features and ignores anything else, such as buildings, trees and bodies. In this paper, we will implement a face recognition system using the Principal Component

Analysis (PCA) algorithm. The face recognition systems tries to find the identity of a given face image according to their memory (training set).

Face recognition algorithm: Face recognition algorithms are used in a wide range of applications viz., security control, crime investigation, and entrance control in buildings, access control at automatic teller machines, passport verification, identifying the faces in a given databases. The Principal Component Analysis (PCA) approach is also known as Eigen faces. PCA is a useful statistical technique that has found application in fields such as face recognition and image compression, and is a common technique for finding patterns in data of high dimension. The basic goal is to implement a simple face recognition system, based on well-studied and well understood methods. One can choose to go into depth of one and only one of those methods. The method to be implemented is PCA (Principle Component Analysis).

Embedded control platform : The embedded control platform is built on one SoC (SEP4020), SEP4020 works at 100MHz, and there are one 8KB data/instruction cache, one MMU, 64KB ESRAM and many functional modules in it. SEP4020 is one low-power SoC, suitable for industry control systems especially with TFT displays.. All face detection codes are realized by standard C language for achieving better portability to be ported from one chip to another without any change.

Images from the Camera: In the system prototype, one USB camera is used to catch images in car, and the data are transmitted to FDS module by USB channel, and the data are transferred into jpeg format files by the chip embedded camera before the transmission. Every image is set to be 320*240 pixels in resolution ratio to remain small in size and could be detected fast. To reduce the hardware cost of the car security system, we realize the face detection process in pure software method. .

MMS Module: In case if the face of the person does not match with the training set, System will send a bit suggesting entry of unauthorized person in the car and thus it will activate the MMS module present in that system. The role of MMS module is to send the image of that unauthorized person on the owners Mobile. Owner will response to this MMS through text, suggesting whether to stop the car or continue it.

GSM MODULE : To achieve important information of cars, one GSM module is added into the car security system. Siemens TC35I GSM modem can quickly send SMS messages to appointed mobile phone or SMS server. So the owner and the police can be informed at the first time. If another GPRS module is added in, the image data could also sent to an information server, and the real-time circumstance in the car could be seen.

GPS MODULE: GSM (Global System for Mobile Communications, originally Group Spécial Mobile), is a standard developed by the European Telecommunication Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular network used by mobile phones. It became the de facto global standard for mobile communications with over 80% market share. The GSM standard was developed as a replacement for first generation (1G) analog cellular networks, and originally described a digital, circuit-switched network optimized for full duplex voice telephony. This was expanded over time to include data communications, first by circuit-switched transport, then packet data transport via GPRS(General Packet Radio Services) and EDGE(Enhanced Data rates for GSM Evolution or EGPRS). GPS technique has been widely used both in military equipments and civil devices in recent years. We choose Jupiter TU30 GPS module to offer the location of the car in time. TU30 has a UART (Universal Asynchronous Receiver/Transmitter), which can be used to communicate with many other embedded devices. It is easy to get a serial of char from TU30 at 9600 bps speed from the UART interface, and the string accords with NMEA-0183(The National Marine Electronics Association) standard. After parsing the string, longitude, latitude, speed and so on of the FDS car can be obtained to judge the precise location of the car now.

GSM/ GPRS Features:

1.High Quality Product (Not hobby grade).
2.Dual-Band GSM/GPRS 900/ 1800MHz.
3.RS232 interface for direct communication with computer or MCU kit.
4.Configurable baud rate.
5.Wire Antenna (SMA connector with GSM Antenna Optional).

6.SIM Card holder.

7.Built in Network Status LED.

8.Inbuilt Powerful TCP/IP protocol stack for internet data transfer over GPRS.

9.Normal operation temperature: -20 ℃ to +55 ℃.

10.Input Voltage: 12V DC.

Feature of this project:

1.Enhanced Wireless Control System 2.Availability: wide range of monitoring as based on mobile GSM network. 3.Reliability: Two tier securities are highly reliable. 4.Portability: This system can be easily implemented in different cars. 5.Scalability: The system can be easily transformed to three-tier security system. 6.Less cost and compact.

Result: The system lock the door, generates a buffer sound, detect thief image by camera and stop the car. then After completion of each of the controlling operation a message is transferred to the owner as an acknowledgment. The door system will get locked. If the system is unlocked then the system locks door else if the system is already locked it keeps the lock. And the message is transferred " the door locked successfully" is transferred as acknowledgement.It stops the motor and detects longitude and latitude information. The alarm sound is produced. It transfers the message as " the car stopped successfully" and latitude and longitude information are transferred. And the camera detects the image of the driver seat the detected image is transfehijacker owner"s PC. It helps to track the hijacker.

Conclusion : From this we implement theft control techniques that can provide the important functions required by advanced intelligent Car Security, to avoid vehicle theft and protect the usage of unauthenticated users. Secured and safety environment system for automobile users and also key points for the investigators can easily find out the hijackers image. We can predict the theft by using this system in our day to day life. This project will help to reduce the complexity and improve security, also much cheaper and „smarter" than traditional ones. This is reliable and efficient system for providing security to vehicles through image processing concept.

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