

SIFT BASED CAR IGNITION SYSTEM

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ABSTRACT

Abstract:

Automotive theft has been a persisting problem driving modern automotive designs in search of technologies to provide high security to the user. There are various methods to digitally authenticate the identity of the user, by means of non-biometric and/or biometric systems. A biometric based ID allows for the verification of “who you claim to be” based on “who you are”, in addition to checking for “what you have” (keys), or “what you know” (password). To incorporate an increased level of security, the state-of-the-art Face Recognition System (FRS) can be used which improves the accuracy with the added feature of being easy to use and maintainable for automobiles.

This paper deals with the design and development of a real time face recognition based car ignition access control system. The developed system consists of an FRS and an ignition controller unit. The FRS unit goes through the process of image data retrieval, image compression and face recognition. The captured test image passes through the face detector, where full face template matching approach has been used. The result of face detector is passed to the face compression block where an economic representation of face is implemented by applying the SIFT algorithm.

Keywords:

Solar sprayer, photovoltaic cells, non-conventional energy etc.

I. INTRODUCTION

Automotive thefts are increasing alarmingly around the world. To give protection to drivers, automotive vehicle manufacturers are making

their products more secure by dumping technologies into automobiles. The key and the basic process of security system involve how it identifies the validity of the user. Biometric and non-biometric are two ways of identifying a person. Non-biometric identification system uses a serial number such as personal ID and password to identify a person; however, non-biometric ID could be forged or taken/stolen by others, which restricts the verification or validity of the ID holder.

This project deals with the design and development of a real time face recognition based car ignition access control system. The developed system consists of an FRS and an ignition controller unit. The FRS unit goes through the process of image data retrieval, image compression and face recognition. The captured test image passes through the face detector, where full face template matching approach has been used. The result of face detector is passed to the face

compression block where an economic representation of face is implemented by applying the SIFT algorithm.

Appearance-based, which uses holistic texture features and is applied to either whole-face or specific. With the help of a pattern classifier, the extracted features of face image is compared with the ones stored in the face database. The face image is then classified as either known or unknown. If the face is recognized as “unknown”, face images can then be added to the database for further comparisons. In this paper the Eigen faces method is described and then it is demonstrated that the features vectors obtained from the Eigen faces can easily be used for classification and recognition.

II. LITERATUREREVIEW

□ A fast algorithm face detection and head pose estimation for driver assistant system

Author:-zhiboguo,huajunliu, qiongwang,jingyu yang.

In this paper, a fast algorithm of face detection and head pose estimation is proposed to estimate the head pose for driver surveillance real time. Firstly, faces are accurately detected based on Mask Transform and SVMs classier.

Subsequently, the face of every frame is tracked in the range of little position and scale. Head pose is estimated on the basis of accurate face detection.

Biometric recognition system for challenging faces

Author:-saiyedumer, bibhaschandradhara, bhabatoshchanda. A novel method for face recognition system using challenging profile and frontal faces is proposed

in this paper. The proposed face recognition system consists of pre-processing, feature extraction and classification components. In this work, for pre-processing, the face region is extracted using facial landmark points, obtained by the tree structured part model. During feature extraction, SIFT descriptors are computed from the detected face region, and Spatial Pyramid Matching approach based on Locality constraints Linear Coding technique is employed for feature representation.

Design and development of car ignition access control system based on face recognition technique

Authors:-n. anukrishnan, *b. ramya, saimamohan

Automotive theft has been a persisting problem driving modern automotive designs in search of technologies to provide high security to the user. There are various methods to digitally authenticate the identity of the user, by means of non-biometric and/or biometric systems. A biometric based ID allows for the verification of “who you claim to be” based on “who you are”, in addition to checking for “what you have” (keys), or “what you know” (password).

III.SYSTEM ARCHITECTURE

We purposed sift based car ignition system, in this system consist three section input section, monitoring section, access section. In input section consist two parts first is camera & second is fingerprint. Camera capture image, precede that image using image processing in MATLAB. If authorize person face match then user access, second security that is fingerprint. In second security fingerprint get scan & match with database. If fingerprint & face get match signal pass to microcontroller.

3.1 Block diagram

Two stages of protection to strengthen the security of the car: Firstly, when the user access the car by the car camera captures the image of person which is then match with database, if image not match with database, the power is remain disable. If the power shifted by others, the second level comes by disabling the starter motor from being turned on, so the stolen image cannot turn the car on. Human identification is field very significant and which has undergone rapid changes with time. An important and very reliable Human identification method is fingerprint identification. Fingerprint of every person is unique. So this helps in identifying a person or in improving security of a system. In second stage, Finger print of a person is „read“ by a special type of sensor. Finger print sensor can be interfaced with a microcontroller. Through keypad we can add new user and delete the existing user, also identify the user by selecting corresponding option through keypad. In this paper we use a fingerprint module to read once identity to start the equipment. For this we use a microcontroller to enable the ignition system if the matching between scanned data and the already existing data is correct. Comparison is done inside the fingerprint module itself and its output is

given to microcontroller. Result is displayed in a LCD display whether the user is authorized or not.

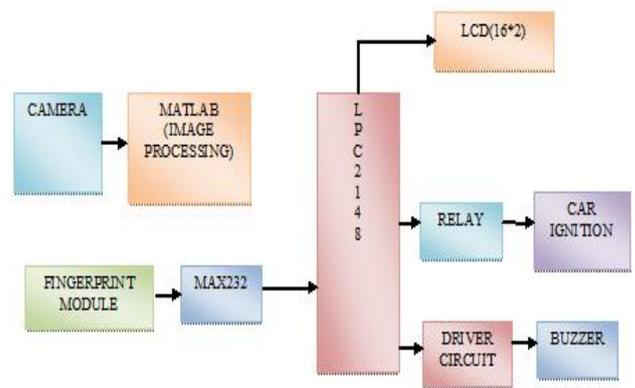


Fig. 1 Block diagram of the system

In this project camera capture image of face. Using image processing capture image get process. We make database of images using MATLAB. We match data base using SIFT algorithm. If capture image get match with database means driver is authorize.

At that time we give signal to microcontroller unit. As soon as signal gets to controller unit, through relay circuit car ignition starts. If face not match with database, at that time car ignition gets lock, buzzer gets activated as unauthorized person access system. All procedure continuously display on LCD display. This project uses two power supplies, one is regulated 5V for modules and other one is 3.3V for microcontroller. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

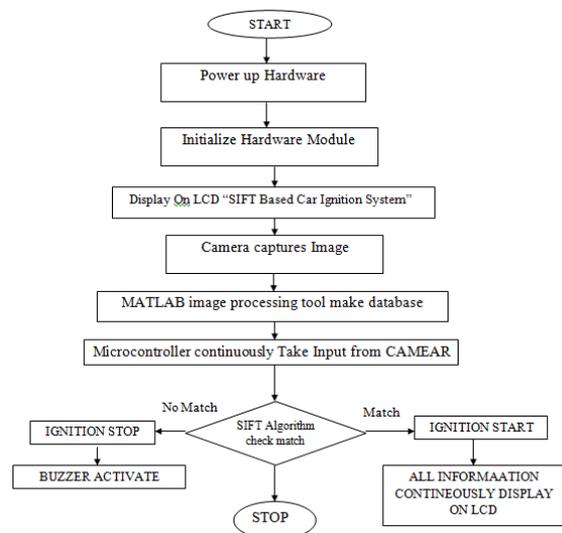


Fig. 2 system algorithm

- STEP 1:- Power Up hardware.
- STEP 2:- Initialize hardware Module.
- STEP 3:-Display On LCD as “SIFT Based Car Ignition System”
- STEP 4:-Camera capture image of face
- STEP 5:-MATLAB Image Processing tool do process on image to make database for image.
- STEP 6:-Using SIFT algorithm check match of image using MATLAB database

STEP 7:-If capture image get match with database car ignition starts.

STEP 8:-If face not match with database, at that time car ignition gets lock, buzzer gets activated.

STEP 9:-All procedure continuously display on LCD display.

IV. COMPONENT DETAILS

- **LPC2148 CONTROLLER**

Founded in November 1990, it is spun out of Acorn Computers, it Designs the ARM range of RISC processor cores. Licenses ARM core designs to semiconductor partners who fabricate and sell to their customers. ARM does not fabricate silicon itself, it also develop technologies to assist with the design-in of the ARM architecture. Software tools, boards, debug hardware, application software, bus architectures, peripherals etc.

- **LIQUID CRYSTAL DISPLAY:**

LCD stands for Liquid Crystal Display. LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs) because of the following reasons: The declining prices of LCDs, The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters. Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU to keep displaying the data. Ease of programming for characters and graphics.

- **BUZZER:**

Piezo buzzer is an electronic device commonly used to produce sound. Light weight, simple construction and low price make it usable in various applications like car/truck reversing indicator, computers, call bells etc.

- **FINGERPRINT MODULE**

Biometric identification from a print made by an impression of the ridges in the skin of a finger is often used as evidence in criminal investigations. Yes, now we can use the same biometric identification technique to build our own hobby projects like a biometric authenticator/access control system with the help of readily-available Fingerprint Identification Modules.

- **Max232**

The MAX232 is an integrated circuit first created in 1987 by Maxim Integrated Products that converts signals from a TIA-232 (RS-232) serial port to signals suitable for use in TTL-compatible digital logic circuits. The MAX232 is a dual transmitter / dual receiver that typically is used to convert the RX, TX, CTS, RTS signals.

- **RELAY**

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

V. ADVANTAGES AND APPLICATIONS

ADVANTAGES

- Low cost.
- Automated operation.
- Low Power consumption.
- It provides an automatic safety system for cars and other vehicles as well.

APPLICATIONS

- Cars
- Trucks
- Buses etc.

VI. CONCLUSION AND FUTURE SCOPE

In this study, we used the Eigen faces to represent the features vectors for human faces. The features are extracted from the original image to represents unique identity used as inputs to the neural network to measure similarity in classification and recognition. The Eigen faces has proven the capability to provide the significant features and reduces the input size for neural network. Thus, the network speed for recognition is raise.

A fast algorithm of face detection and head pose estimation is proposed in this paper. The driver's face can be detected and head pose can be estimated accurately based on this algorithm. The experimental results on many videos show that this algorithm is rapid, exact and robust to detect face and estimate head pose during driving

A special case of face recognition algorithm (Face filter + PCA) is used. The developed FRS has achieved higher accuracy than the typical PCA. The system is capable of recognizing faces and overcome following challenges,

- Objects partially covering face (e.g.: Sun Glasses, Long Hair)
- Low resolution images
- Facial expressions
- Dynamic background
- Skin color variations

Although a number of efforts has been made on pose-invariant face recognition, the performance of current face recognition system can still be improved. Sensitivity to extreme poses and different lighting conditions is still a challenging problem.

VII. REFERENCES

- [1] Guo, Zhibo, et al. "A fast algorithm face detection and head pose estimation for driver assistant system." *Signal Processing, 2006 8th International Conference on*. Vol. 3. IEEE, 2006.
- [2] Umer, Saiyed, Bibhas Chandra Dhara, and Bhabatosh Chanda. "Biometric recognition system for challenging faces." *Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG), 2015 Fifth National Conference on*. IEEE, 2015.
- [3] Anukrishnan, N., B. Ramya, and Saima Mohan. "Design and development of car ignition access control system based on face recognition technique." *SAS TECH Journal* 9.2 (2010): 63-70.
- [4] Zhuang, Liansheng, et al. "Low-resolution face recognition via sparse representation of patches." *Image and Graphics, 2009. ICIG'09. Fifth International Conference on*. IEEE, 2009.

[5] YUAN, Yan-Yan, and Xiao-Wei HUI. "Face Detection Based on YCbcr Skin Color Model and SNOW Classifier [J]." *Computer Systems & Applications* 1 (2010): 035.

[6] Wu, Junwen, and Mohan M. Trivedi. "Visual modules for head gesture analysis in intelligent vehicle systems." *Intelligent Vehicles Symposium, 2006 IEEE*. IEEE, 2006.