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Electronic Eye for Home Security Face Recognition System

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Abstract—*Electronic eye describes the design and implementation of Door image capture using Microcontroller based security face recognition system for home and offices. It provides the user with efficient and reliable security system for Door image capture for home, offices and industries that supports the use of an sensor at the door to send the signals to control unit of electronic eye with buzzer alarm for face recognition security purpose with image capture as soon as the door opens with face recognition image capture at the output of laptop or PC with VB application. In past days, the research is gone on various door lock security systems like traditional security systems which provide indications using alarm. Due to the advancement in recent techniques, some door lock security systems are based on microcontroller, GSM, GPS, many sensors, software like MATLAB, PROTEUS, biometrics like face recognition, Iris scanner, RFID, Smart Card and password etc. As face recognition security becomes major problem nowadays, use of the latest technology needs to make face recognition security monitoring system based on embedded and Zigbee and sometimes the lock is protected by automatic password hence it could not easily hack by hackers. Also the enhanced security systems are available based on android platform, wireless techniques and embedded systems. A lot of modification takes places in various face recognition with electronic eye.*

Keywords*: Electronic Eye, Home Security face recognition system, monitoring, room locker, Arduino, Buzzer alarm, face detection, data base files.*

1. INTRODUCTION

Security is primary concern with day to day life and properties in our environment. This paper describes effective home security face recognition alarm system that can monitor image capture system with the help of VB application. As soon as door opens sensor gets activated with image captured with help of Web camera in PC captured image gets saved within VB application. It also serves function of sensing and detecting false intrusion (using input sensory device and gives early warning devices alarm and remotely controlled security system). The term false intrusion here is used to mean any form of attempt to gain entry without proper pre design protocols [1]. Security represents protection of our life and assets. Ensuring safety of peoples and their valuable things is very important for the prevention of illegal handling. Hence, mainly focusing on home door lock security or gate security is very important to avoid the further problems in monitored area [2]. The main idea of paper is to drive further research in this area are security applications and human-computer interaction. Face recognition represents an intuitive and nonintrusive method of recognizing people and this is why it became one of three identification methods used in e-passports and a biometric of choice for many other security applications. .

2. METHODOLOGY

Face recognition security system has been concern of worldwide. As technology is emerging every second abundant home based or office based or industries based face recognition security systems have been developed and implemented to keep welfare security safe. Home security system is an essential mean of protecting homes from illegal invasion and false intrusion. The interest into face recognition is mainly focused on the identification requirements for secure information systems, multimedia systems, and cognitive sciences. Interest is still on the rise, since face recognition is also seen as an important part of next-generation smart environments. Automation in face recognition security system plays an increasingly important role in the world economy. Automatic face recognition security systems are being preferred over manual system. Through this paper we have tried to show home automatic face recognition security system control of a house as a result of which power is saved to some extent with the help of home automation for door image face recognition capture for security system. The block diagram for the proposed system is shown in fig.1 Face recognition technology is the least intrusive and fastest biometric technology. It works with the most obvious individual identifier – the human face below.

Face recognition technology is the least intrusive and fastest biometric technology. It works with the most obvious individual identifier – the human face. Instead of requiring people to place their hand on a reader (a process not acceptable in some cultures as well as being a source of illness transfer) or precisely position their face in front of a scanner, face recognition systems unobtrusively take pictures of people's faces as they enter a defined area. There is no intrusion or delay, and in most cases the subjects are entirely unaware of the process. They do not feel "under surveillance" or that their privacy has been invaded.

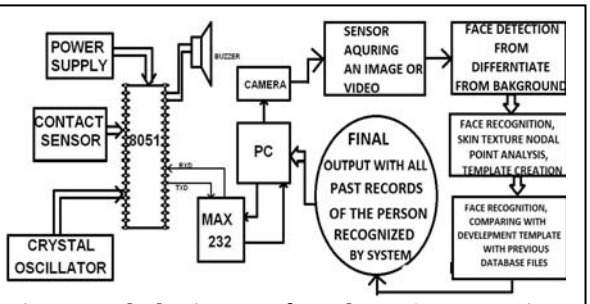

Figure 1. Block Diagram of Hardware System Design

3. DOOR IMAGE CONTACT SENSORS[6]

The NOM02B4-DR11G contact image sensor (CIS) module integrates a red LED light source, lens and image sensor in a compact housing. The module is designed for document scanning, mark reading, gaming and office automation equipment applications and is suitable for scanning documents up to 256 mm wide with a scanning rate of 410 sec/line. The analog output signal is processed by a digitizing comparator referenced to an externally supplied voltage level to produce a serial digital output. The NOM02B4−DR11G module employs proprietary CMOS image sensing technology from ON Semiconductor to achieve high-speed performance and high sensitivity

4. WEB CAMERA WITH FACE RECOGNITION AND DETECTION

A video camera collects the images from the reference points of face recognition system with face detection and face recognition then converts into electronic signals. The collected images are converted from visible light into invisible electronic signals inside a solid-state imager. These signals are transmitted to the monitor. This type of automatic wireless video monitors is quite suitable for the isolated restricted zones, where the tight security is required. Once upon a time much importance is not given for the security system. But now-a-days security has became a major problem and need has aroused to develop different types of security systems for various applications to safe guard the zones of various types like industries, offices, homes etc,

The wireless camera used here designed using video and image monitoring system, for detecting the presence of things which are exactly at the entrance of the restricted zone at door of home face recognition security system. This type of automatic wireless video and image monitors is quite suitable for the isolated restricted zones, where the tight security is required. The principle of remote sensing is utilized in this, to detect the presence of any things/persons at very near to particular point.

5. WEB CAMERA IMAGE DETECTION AND RECOGNITION SAVER

Web Cam Image detection and recognition Save, adds a label with the date/time that the image was captured into the image, by using the font, color, and date/time format that we choose. We can also capture a single camera image detection and recognition from command-line, without displaying any user interface.

Web Cam Image detection and recognition Save is simple WEBCAM capture utility that allows to easily capturing a still image from our camera every number of seconds that we choose, and save it into image file (.jpg, .png, .bmp) on our disk. We can format the saved image filename with the date/time that the image was taken according to our preferences for example: C:\images\img20110725_123256.jpg [1]

6. MICROSOFT VISUAL BASIC FACE RECOGNITION APPLICATION

Visual Basic is an advanced version of BASIC programming language with visual and event driven programming. It is helpful in creating a graphical user interface in many applications with help of the components available on the window. Visual Basic 6.0 is the latest version used in this work. Figure shows the screenshot for the electronic eye for home security image capture face recognition security system in visual basic [1].

The Visual basic program has used here for producing the interface of secure home door capture image of detection and recognition for home security purpose. It mainly consists of the interface that connects the electronic eye (control circuit) and the VB application programming in PC. The VB application software to interface hardware system connected to the PC using the COM ports and provides GUI for user. COM ports of hardware system and PC can be easily selected from the boxes provided on the interface. The GUI basically provides user friendly environment to operate and monitor the security system.

Figure 6. Screen Shot for Created Microsoft Visual Basic Face Recognition Application

7. ANALYTICAL RESULTS WITH STARTING MAIN PROGRAM FACE RECOGNITION SYSTEM

The results are shown in the Fig. 7 and Fig. 7.1. The contact sensor senses the intrusion movement around the access door of home. And on detecting motion, it triggers the buzzer alarm system module and to capture the image with detects and recognized with differentiate from background with skin textual nodal analysis and gives the processed result (Fig. 7 and Fig.7.1). If access is granted, the alarm turned on as soon as the person may enter the room the web camera captured image and image will be detected and recognized which saved through VB application software in web camera face recognition system.

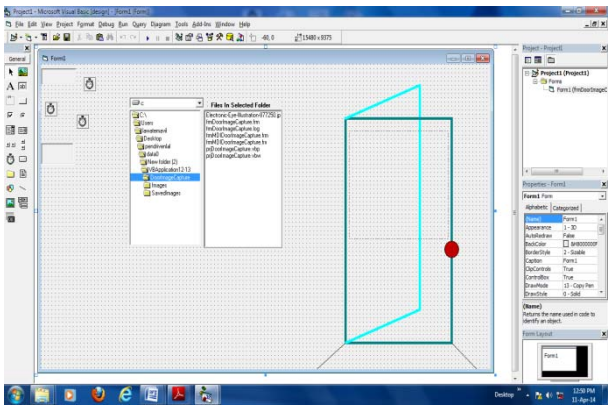

Figure 7. Screenshot of Main Program form Basic Face Recognition Application

7.1 Analytical result Image of Face recognition of same person from Electronic Eye Home security System.

From the above results shown in figure 7.1.1, we can see that our system has completed all its main functions such as face detection and recognition Image Capture through Web Camera with developed working model is tested in real time applications. This mechanism is applied by us at our home to test the reliability of the product.

Capture - a physical or behavioral sample is captured by the system during enrollment

Extraction - unique data is extracted from the sample and a template is created

Figure 7.1 . Image of Face recgonition Comparing with development template with previous data base files

Comparison - the template is then compared with a new sample

Matching - the system then decides if the features extracted from the new sample are matching or not..

Figure 7.1.1 . Image of Face recgonition of same person from Electronic Eye Home security System.

When the user faces the camera, standing about two feet from it. The system will locate the user's face and perform matches against the claimed identity or the facial database. It is possible that the user may need to move and reattempt the verification based on his facial position. The system usually comes to a decision in less than 5 seconds

8. CONCLUSION

Hence, Microcontroller based visual basic Electronic Eye for face recognition home security system, device that utilizes Sensor input as key for users' access. It has been successfully demonstrated that, this will serve as a device for securing personal wares in environments where it is deployed against intruders by setting off appropriate face detection and recognition with skin texture with nodal point analysis as template creation for every home door opens. Therefore, it can

be said that the objectives have been met, hence conclusion is made that this is a successful undertaking design and implementation of Door image capture, detection and recognition using Microcontroller visual basic face recognition security system for home and offices. It provides the user with efficient and reliable security system for Door image capture for home, offices and industries that supports the use of an sensor at the door to send the signals to control unit of electronic eye with face recognition for security purpose with image capture as soon as the door opens with image capture at the output of laptop or PC with VB application output.

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