

SECURE AUTHENTICATION USING COLOR AND GESTURE RECOGNITION

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ABSTRACT

Now in the present world we can provide security to the system through the password. But there are some softwares like keylogger which directly send the information which we are typing to the hacker. So even if the folder is secured by password the hacker will come to know the password and the security is breached. So we develop a system which provide security to the folder in the system.

Now the system which we develop in which user would wear colored rings in his fingers and make gestures in front of web cam then camera captures the gestures. Since computer vision involves the identification and classification of objects. A RGB to binary conversion algorithm is proposed in this technique. This algorithm is for color recognition to determine the co-ordinates of the colors and then co-ordinate mapping will be performed. The co-ordinates captured will be mapped with the one previously stored and accordingly exact alphabet will be captured. In which we also provide a SMS module this is for if any unauthenticated user will access the system then SMS is send to the authenticate user.

Keywords: keylogger, Gesture, Coordinate Mapping.

INTRODUCTION

In the present world we can provide secure authentication to the system through the password. But there are some softwares like keylogger which directly send the information which we are

typing to the hacker. So even if the folder is secured by password the hacker will come to know the password and the security is breached. So we have come up with a system which would provide security to the folder in the system.

In this system the colored rings weared in fingers can be identified. Since computer vision involves the identification and classification of objects. A RGB to binary conversion algorithm is proposed in this technique. Using color recognition to determine the co-ordinates of the colors the co-ordinate mapping will be performed.

In this system a webcam is placed in front of the user who wish to access the folder. The user would be wearing colored rings in his fingers. When the user makes the gestures of the alphabets, the webcam will capture the exact positions of the rings and the system perform image processing using color recognition to determine the co-ordinates of the colors. The co-ordinates captured will be mapped with the one previously stored and accordingly exact alphabet will be captured. Continuing in this way the user will be able to go through the entire password that he wants to enter.

By using this system it would beneficial to the user as the folder and the data within the system remains safe. Also the system can be useful for the banking sector where the data or information related to user bank account will need to remain safe. also this type of system can be useful to give security to our Facebook account, Gmail account .

Contribution:

In these newly develop system user needs to have color rings wared in users hand if any case user need not able to ware the rings he or she can only ware the same colored object in hand .After having colored ring user can make gesture in front of the camera which is mainly use in our system then camera can capture that gesture in the form of frame and store that. by using these capture frame the system make image processing that is first convert that color image which is store in frame into gray form using algorithm and then gray to machine level that is in the form of binary will done after all these gesture are matches with previously store value of password in the database the system will provide access a user. Each user have its own style to making gesture so no any one hacker can copy the same. So these system will provide more security than previous system for authentication.

Here main contribution as compared to previous system are:1]Camera is placed on laptop or PC. 2]Colored Rings 3]Coordinate mapping.4]Browse folder to unlock.5] Click on Button1 to

initialize camera. 6]Making Gesture. 7]Coordinate mapping 8]Binary Conversion 9] Unlock Folder.

Structure: This paper is organized as follows: Section 2 presents related work. Section 3 Reviews our basic algorithm, Our schemes to this algorithm are then presented in Section 4. Working environment of these system in Section 5. Finally, in Section 6 we conclude our system and present idea for future work.

RELATED WORK

On [2] a user logging in the system, Face Authentication will use face recognition technologies to analyze and determine his ID as well as his permissions on the system. This model can be applied to access control systems where the number of people is small. For example, user accounts in an operating system, members of an office or a family. When receiving a request, an access control system based on face authentication must find out exactly whether the person requesting is a client or an impostor. Most of present researches try to create an Automatic Face Recognition model. The hardest part of it is how to get best biometric information on the faces. Therefore, Feature Extraction is the most important module of the system.

The biometric use of retina scan is used to examine the pattern of blood vessels at the back of the eye. The blood vessels within the retina absorb light more readily than the surrounding tissue and are easily identified with appropriate lighting. A retinal scan is performed by casting an unperceived beam of low energy infrared light into a person's eye as they look through the scanner eyepiece. This beam of light traces standardized path on the retina. Because retinal blood vessels are more absorbent of this light than the rest of the eye, the amount of reflection varies during the scan. The pattern of variations is converted to computer code and stored in a database.

Hand Gesture recognition [1] system is also used by some people. As for personal authentication using hand gestures, there has not been a lot of research done to investigate the uniqueness of hand gestures, that is, the hand shape tightly coupled with sequential hand movements. This caused an opportunity for research in categories such as securities, password-based access control, etc. hand gestures is sign language recognition which has been researched extensively. Sign languages are the most structured gestures made by humans. The meaning of

agesture is dependent on hand shape, direction and sequence which can be an alphabet, word or number.

Edge detection[4] aims at identifying points in a digital image at which the image brightness changes sharply. In this system an edge is the boundary between an object and the background and indicates the boundary between overlapping object .Canny edge detector, Sobel edge detector, Prewitt edge detector and zero crossing detector this are the some types of edge detection algorithms. The disadvantages of these cross operator are sensitivity to the noise, in the detection of the edges and their orientations. The increase in the noise to the image will eventually degrade the magnitude of the edges.

METHODOLOGY

For implementation of this system we require different colors rings having different colors and web camera is required for capturing the gestures.The user would be wearing colored rings in his fingers. When the user makes the gestures of the alphabets, the webcam will capture the exact positions of the rings and the system perform image processing using color recognition to determine the co-ordinates of the colors. The co-ordinates captured will be mapped with the one previously stored and accordingly exact alphabet will be captured. Continuing in this way the user will be able to go through the entire password that he wants to enter.While implementing system there are different module involve in the system are as :

1. Camera interfacing

At the time of giving gesture it is necessary to interface the camera. Camera interfacing use to capture the frame continuously and gives the captured frame to the next phase that is RGB to Binary conversion phase.

2. Binary conversion

In which RGB to gray and then gray to binary conversion take place.

3. Gesture training

User make gesture in front of camera.

4. Gesture recognition

The webcam will capture the exact positions of the rings and the system perform image processing using color recognition to determine the co-ordinates of the colors. The co-ordinates captured will be mapped with the one previously stored and accordingly exact alphabet will be

captured. The gesture recognition input image from camera. These steps are preprocessing, features estimation and extraction, and classification or recognition. The pre-processing module of the system developed involves the application of morphological operations and color recognition is system is mostly classified into three major steps after acquiring the in order to segment the image into regions of interest. The feature extraction is a very crucial step in the gesture recognition algorithm. Feature vector of the segmented image can be extracted in different ways depending on the application. Thus, the results are not dependent on the skin color or the background of the image gestures obtained

5. Color Recognition

Color recognition is one of the most important thing in computer vision. The color recognition process serves to simplify the analysis of gestures by drastically reducing the amount of data to be processed, while at the same time preserving useful structural information about object boundaries. Color recognition in gestures is far more challenging task than gray scale images as color space is considered as a vector space. Almost 90% of color information in a gesture can be found in the corresponding grayscale image. However, the remaining 10% can still be vital in certain computer vision tasks. Furthermore human perception of color image is more enriched than an achromatic picture. Several color models are present such as RGB color model, YUV model, CMY color model, CMYK color model, HIS color model.

SYSTEM ARCHITECTURE

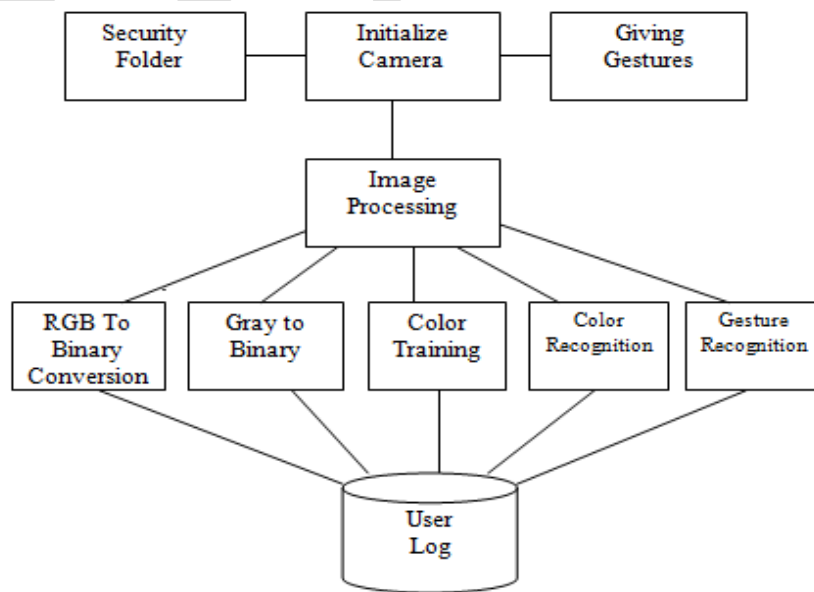


Fig: System Architecture

DESIGN AND SPECIFICATION

Hand gesture recognition system model

Let S be a hand gesture recognition system that recognizes hand gesture.

$$S = \{ I, G, M, F, O \}$$

where, I is a set of input hand gestures;

G represents a set of single-handed anticipated static gestures;

M represents co-ordinate mapping operations such as

Binary code	Alphabets
0001	A
0010	B
0011	C
0100	D
0101	E

Table (1) Co-ordinate mapping

F represents feature vector for G.

O represents output with application interface (A);

$$G = \{ G1, G2, \dots, G6 \}$$

$$I = \{ I1, I2, \dots, I5 \}$$

$$G \subseteq I$$

M = {co-ordinates mapping alphabets};

$$G \subseteq M$$

$$F = \{ f1, f2, \dots, f5 \}$$

$$O = \{ A1, A2, \dots, A7 \}$$

Success of the system will be depend upon when

(i) $I_i = F_j$ where $I_i \in I$

$F_j \in F$ where $1 \leq j \leq 5$

Failure of the system when

(ii) For a gesture(I) no feature vector is found

$I_i \neq F_j$ where $I_i \in I$

$F_j \in F$ where $1 \leq j \leq 5$

(iii) For two different gesture (I) same feature vector found

$I_i = F_j$ and $I_k = F_j$ where $I_i, I_k \in I$

$F_j \in F$ where $1 \leq j \leq 5$

Algorithm

1. Capture frame from webcam.
2. RGB to gray conversion.
3. Gray to binary conversion.
4. Color training
5. Learn color code
6. Identify gesture
7. Decision making
8. Perform action
9. Repeat from step 6

RGB to Binary image conversion algorithm

Step 1: Set Red filter's minimum value

Step 2: Set Red filter's maximum value

Step 3: Set Green filter's minimum value

Step 4: Set Green filter's maximum value

Step 5: Set Blue filter's minimum value

Step 6: Set Blue filter's maximum value

Step 7: Scan through the image horizontally & vertically

Step 8: Store the current RGB value in variables

Step 9: Compare the variables' values with the set filter values

Step 10: If current value fits in the filter range, set the pixel white in the binary image

Step 11: If current value DOES NOT fit in the filter range, set the pixel black in the binary image

FEATURE SCOPE

- 1) The aim of this paper is to develop robust and efficient color recognition algorithm where three algorithms for gesture recognition using different color spaces with required morphological gestures.
- 2) Moreover we can also use this system in some of the applications like facebook, gmail and also our secure data folder.

EXPERIMENTAL SETUP

In previous all methods such as Retina Scan, Hand Gesture, Face Recognition, Edge Detection some drawback are overcome in our new system we try remove all drawback and provide better security mechanism. It will be performed in development environment of Microsoft Visual Studio 2008 and Dot Net Framework 3.0. with any windows and on Pentium IV processor , 1 GB of RAM .

CONCLUSION

By using this system we provide much more security than previous available system because in this system we use gestures and gestures are not store any where in the database we can perform gesture only at the run time.

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