

Iris Recognition System using canny edge detection

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Abstract : A biometric system provides automatic identification of an individual based on a unique feature or characteristic possessed by the individual. Iris recognition is regarded as the most reliable and accurate biometric identification system available. Especially it focuses on image segmentation and feature extraction for iris recognition process. The performance of iris recognition system highly depends on edge detection. The Canny Edge Detector is one of the most commonly used image processing tools, detecting edges in a very robust manner. In this process first step is generation of OTP. Login by using OTP and matches the input iris with the reference iris which is already stored in database. that matched iris image is sent to the mail ID which is provided admin.

Index Terms- RSA algorithm, Canny edge detection algorithm, Routing algorithm.

I. INTRODUCTION

With an increasing emphasis on security, automated personal identification based on biometrics has been receiving extensive attention over the 1990s. Iris recognition, as an emerging biometric recognition approach is becoming a very active topic in both research and practical applications. Iris recognition is the process of recognizing a person by analyzing the apparent pattern of his or her iris. A typical iris recognition system includes iris imaging, iris detection, feature extraction and recognition. In this paper, we illustrate the existing techniques utilized at the different stages of the iris recognition process and evaluate their performance. In addition, we explore additional techniques to improve performance. Iris Recognition is one of the important biometric recognition systems that identify people based on their eyes and iris. In this paper the iris recognition algorithm is implemented via histogram equalization and wavelet techniques. In this paper the iris recognition approach is implemented via many steps, these steps are concentrated on image capturing, enhancement and identification. Different types of edge detection mechanisms; Canny scheme, Prewitt scheme, Roberts scheme and Sobel scheme are used to detect iris boundaries in the eyes digital image. The implemented system gives adequate results via different types of iris images.

II. EXISTING SYSTEM

Form a privacy perspective most concerns against the common use of biometrics arise from the storage and misuse of biometric data, e.g. tracking persons without consent. Biometric cryptosystems and cancelable biometrics represent emerging technologies of biometric template protection addressing these concerns and improving public confidence and acceptance of biometric systems. In order to protect templates from infiltration, e.g. based on brute-force attacks, underlying biometric features are required to exhibit sufficient entropy, i.e. iris represents the biometric modality of choice for high security authentication based on template protection technologies. Most publications regarding iris recognition aim at extracting discriminative biometric templates while only few, usually trivial, comparison techniques, e.g. fractional Hamming distance, have been proposed. Advanced iris-biometric comparators have received only little consideration, i.e. potential improvements in the comparison stage are frequently neglected. In this cumulative thesis iris-biometric template protection and advanced comparators are investigated. Based on detailed descriptions of published approaches in both research subareas an overview and discussion, including an experimental study, are presented.

III. PROPOSED SYSTEM

We developed a windows application of narrow iris recognition system to achieve a high effective iris recognition system.

- We used different security algorithms.
 1. RSA algorithm for OTP generation and abstraction.
 2. Canny edge detector algorithm for matching of iris.
 3. Routing algorithm for sending a matched image to mail.

ALGORITHMS DESCRIPTION :

a. RSA Algorithm

It is used to encrypt and decrypt messages. It is most important public key cryptosystem. The encryption key is public and it is different from the decryption key which is kept secret.

- 1. Public-key encryption:** This idea omits the need for a “courier” to deliver keys to recipients over another secure channel before transmitting the originally-intended message. In RSA, encryption keys are public, while the decryption keys are not, so only the person with the correct decryption key can decipher an encrypted message.
- 2. Digital signatures:** The receiver may need to verify that a transmitted message actually originated from the sender (signature), and didn't just come from there (authentication). This is done using the sender's decryption key, and the signature can later be verified by anyone, using the corresponding public encryption key

b. Canny Edge Detection Algorithm

It is a multi stage algorithm to detect a wide range of edges in images. To get the proper edge map hysteresis thresholding is employed which will link between the weak and strong edges. The weak edges are taken into consideration if and only if it is connected to one of the strong edges or else it is eliminated from the edge map. The strong edge is the one whose pixel is greater than the high threshold and weak edge is one whose pixel value lays between high and low threshold.

Then using that, the pixel strength and orientation of that gradient is computed. In the next step it finds the all maxima's present in the image then it keeps them as it and removes the other non-maxima's. The process is called as Non-Maxima Suppression. In the step 4 it makes the pixel either the edge or non-edge, depending on the high and low thresholds set. The block diagram of the “canny edge detector”.

The three main criteria's of the canny edge detection are as follows:

1. Low error rate
2. Good Localization
3. Single Response

The threshold is same for all the images. Due to this it has some limitations, when applied to the block level of the image. It gives some false edges in the plain region and fails to detect the some significant edges. In order to overcome from the above limitation an adaptive thresholding block and the block classification blocks are added along with the above blocks. And the threshold is set different based on the block. Thus the performance of the proposed block level canny edge detector is improved.

STEPS:

1. Noise reduction:

To remove noise in image with a 5*5 gaussian filter.

2. Finding intensity gradient of the image:

Image is filtered with sobel kernel in both horizontal and vertical direction.

3. Non-maxima's suppression:

Scans every pixel to remove unwanted noise.

4. Hysteresis thresholding:

Above threshold values is called edges, below are non edges and they are to be removed.

BLOCK DIAGRAM:

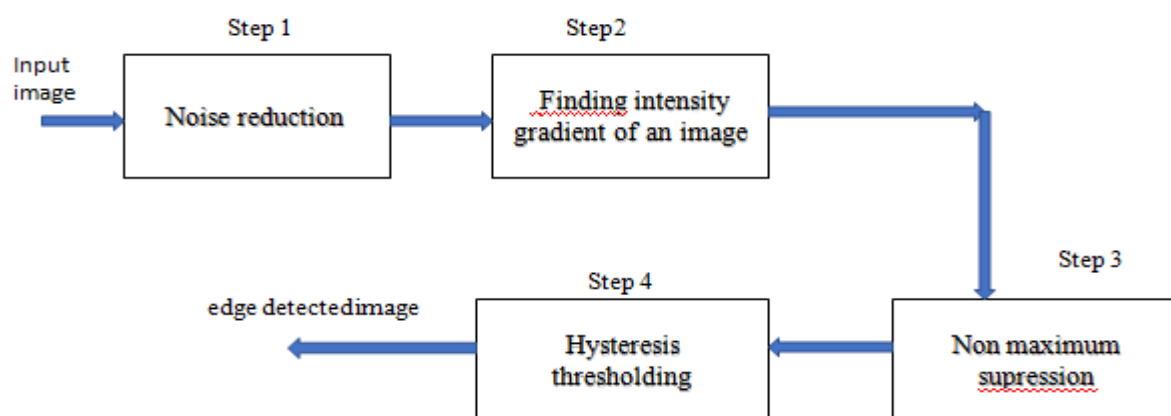
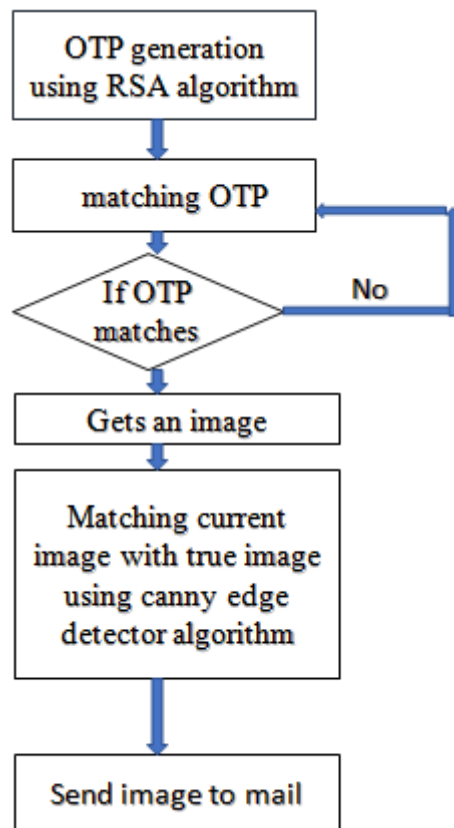


Fig: Block diagram of canny edge detection algorithm

FLOW CHART:**Fig:** Flow chart of canny edge detector**c. Routing Algorithm**

A routing algorithm is that part of the network layer responsible for deciding which output line an incoming packet should be transmitted on. If datagrams are being used this decision is made again for each packet coming from the same host. For virtual circuits you have session routing.

Different steps involved:

- **OTP:**

In this module ,otp has sent to admin mail id ,if otp match only admin can enter into admin panel.

- **IRIS :**

In this module, admin can browse an image which is stored in local drive, and match the image to iris image if match result to success.

- **Mail:**

In this module, admin can send matched image to mail.

Advantages:

- Hacking is not possible
- Election malpractice can be stopped
- Imitation is not possible
- High security

IV.CONCLUSION

We describe in this paper efficient techniques for iris recognition system with high performance from the practical point of view. These techniques are: • A method of evaluating the quality of an image in the image acquisition step and excluding it from the subsequent processing if it is not appropriate. centre of the pupil and localizing eye image. • A computer graphics algorithm for detecting the the iris area from an • Transforming the localized iris area into a simple coordination system. • A compact and efficient feature extraction method which is based on 2D multiresolution wavelet transform. • Matching process based on Hamming distance function between the input code and the registered iris codes. The system out the recognition rate is about 97.3%.

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