International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE)
ISSN: 0976-1353 Volume 21 Issue 1 – APRIL 2016.

SECURE AUTHENTICATION OF IRISCODE USING PATTERN ANALYSIS

Salomi.D[#1], Geetha.J[#2], Rajesh.S[*3]

[#1#2]*Student, Department of IT,Karpaga Vinayaga college of Engineering and Technology*
[*3]*Asst.Prof, Department of IT,Karpaga Vinayaga college of Engineering and Technology*

Salomi1029@gmail.com
rajesh.kvcet@gmail.com

***Abstract*-The experimental results shows that biometric templates, including iris and users attributes, produced by different recognition methods can be matched through the central rays in their convex polyhedral cones and that templates protected by a method extended from Iris-templates can be broken into. These experimental results indicate that, without a thorough security analysis, convex polyhedral cone templates cannot be assumed secure. In this paper, the presence of a contact lens, particularly a textured cosmetic lens, poses a challenge to iris recognition as it obfuscates the natural iris patterns. Many types and colors of lenses are available from a number of different manufacturers. To analyze the effect of these parameters on iris recognition. The proposed approach outperforms other lens detection algorithms on the improved iris recognition performance. Detection of the presence of a contact lens is the first step to improving the usability and reliability of iris recognition for contact lens wearers. The extraordinary market success of Iris-templates relies heavily on its computational advantages, including extremely high matching speed for large-scale identification and automatic threshold adjustment based on image quality many methods modified from Iris-templates were proposed for iris and user attributes based recognition.**

Key Words :Biometrics,Iris recognition, Daugman Algorithm,Template protection.

I. INTRODUCTION

A biometric feature is an inherent physical or behavioral trait that is unique among individuals.Human iris can also be considered a valid biometric feature for personal identification.The iris is the colored ring on the human eye between the pupil and the white sclera.Each human iris has a unique "Spoof texture" of subtle features that varies greatly from person to person. Iris features remain constant over an individual's lifetime and are not subject to changes produced by the effects of aging as other biometric features.

II. RELATED WORKS

2.1 EXISTING SYSTEM:

The Biometric Features is basically used to identify the individuals Face, Fingerprint, Handprint, Voice and etc.If one tries to identify the people's image using face, it will take some serious and tedious parts. Such as the skin may get shrinks as time goes, so the unique identification gets changed and may show some false-positive results. One can take different parts of a face and analyze the presence of the person.If we consider the Hand print, it will also be unique for each and every person but even that gets similar between people. Basically the Hand print is also unable to believe it to be true or fake.And finally voice recognition is also said to be one of the Biometric Feature to recognize the person, but still it also Creates the bottle neck problems and couldn't be able to assured.

2.2 DISADVANTAGES:

In this approach the iris images will occupy more memory space the in the database. In early things the eye has to match exactly with the database as if we stored the image. Even a small distraction also will not be allowed.One can take different parts of a face and analyze the presence of the person.

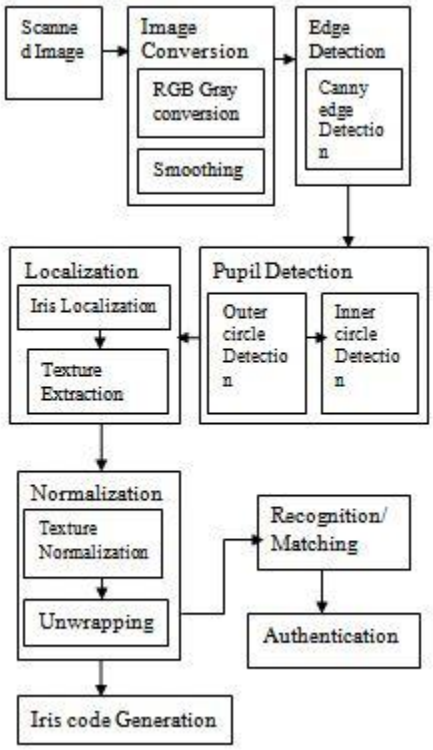
2.3 PROPOSED SYSTEM:

Fourier transform to detect periodic fake iris patterns that were prevalent in textured lenses manufactured at that time. IRIS is one of the most promising biometric modalities, and is in regular use in large-scale applications such as UAE port of entry and India's UIDAI (Aadhar) projects.Median filters, which influence the distributions of the bits to identify the Hamming distance of phase.Wearing of contact lenses, both soft contacts and textured "cosmetic" soft contacts, degrades the accuracy of iris recognition.Our post-processing techniques are Normalization, Segmentation using phase-based, texture analysis methods.

2.4 ADVANTAGES:

Using this technique, the user will have the unique identification for his personal details.Two different contact lens iris image datasets have been collected, independently in different countries, using different iris sensors and sampling different brands of contact lenses.We can have more efficiency and security to the applications and also there will less memory usage while storing in the data base.Instead of storing the iris image, the iris code is going to store in the database.

III. SYSTEM ARCHITECTURE



IV. MODULE DESCRIPTION

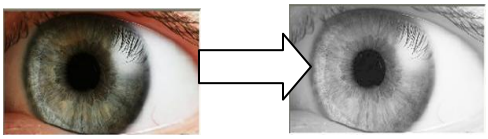
4.1 Modules:

- Image conversion
- Edge detection
- Pupil detection
- Normalization
- Feature Extraction
- Matching

a) Image Conversion :

Grayscale images are distinct from one-bit black-and-white images, which in the context of computer imaging are images with only the two colors, black, and white (also called *bi-level* or *binary images*). Grayscale images have many shades of gray in between. Grayscale images are also called monochromatic, denoting the absence of any chromatic variation.

Grayscale images are often the result of measuring the intensity of light at each pixel in a single band of the electromagnetic spectrum (e.g. infrared, visible light, ultraviolet, etc.), and in such cases they are monochromatic proper when only a given frequency is captured. But also they can be synthesized from a full color` image; see the section about converting to grayscale.



Original Image **Grayscale Image**

b) Edge Detection :

Edge detection is a fundamental tool in image processing and computer vision, particularly in the areas of feature detection and feature extraction, which aim at identifying points in a digital image at which the image brightness changes sharply or, more formally, has discontinuities. The edges extracted from a two-dimensional image of a three-dimensional scene can be classified as

- Viewpoint dependent
- Viewpoint independent

A *viewpoint independent edge* typically reflects inherent properties of the three-dimensional objects, such as surface markings and surface shape.

A *viewpoint dependent edge* may change as the viewpoint changes, and typically reflects the geometry of the scene, such as objects occluding one another.

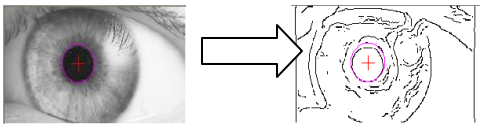
Canny Edge Detection Algorithm:

The Canny algorithm basically finds edges where the grayscale intensity of the image changes the most. These areas are found by determining gradients of the image.

Gradients at each pixel in the smoothed image

The algorithm runs in 5 separate steps:

1. **Smoothing**: Blurring of the image to remove noise.
2. **Finding gradients**: The edges should be marked where the gradients of the image has large magnitudes.
3. **Non-maximum suppression**: Only local maxima should be marked as edges.
4. **Double thresholding**: Potential edges are determined by thresholding.
5. **Edge tracking by hysteresis**: Final edges are determined by suppressing all edges that are not connected to a very certain (strong) edge.

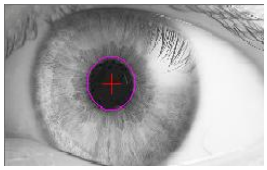


c) Pupil Detection:

The acquired iris image has to be preprocessed to detect the iris, which is an annular portion between the pupil (inner boundary) and the sclera (outer boundary). The first step in iris localization is to detect pupil which is the black circular part surrounded by iris tissues. The center of pupil can be used to detect the outer radius of iris patterns. The important steps involved are:

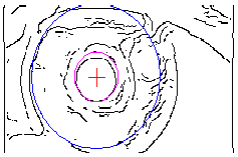
- Pupil detection(Inner Circle)
- Outer iris localization

Circular Hough Transformation for pupil detection can be used. The basic idea of this technique is to find curves that can be parameterized like straight lines, polynomials, circles, etc., in a suitable parameter space.



Detection of inner pupil boundary

External noise is removed by blurring the intensity image. But too much blurring may dilate the boundaries of the edge or may make it difficult to detect the outer iris boundary, separating the eyeball and sclera. Thus a special smoothing filter such as the median filter is used on the original intensity image. This type of filtering eliminates sparse noise while preserving image boundaries. After filtering, the contrast of image is enhanced to have sharp variation at image boundaries using histogram equalization.



d) Normalization:

Must remove blurred images before feature extraction. Localizing iris from an image delineates the annular portion from the rest of the image. The concept of rubber sheet modal suggested by Daugman takes into consideration the possibility of pupil dilation and appearing of different size in different images. For this purpose, the coordinate system is changed by unwrapping the iris and mapping all the points within the boundary of the iris into their polar equivalent. The mapped image has 80 × 360 pixels. It means that the step size is same at every angle. This normalization slightly reduces the elastic distortions of the iris.

f) Feature Extraction:

Corners in the normalized iris image can be used to extract features for distinguishing two iris images. The steps involved in corner detection algorithm are as follows

S1: The normalized iris image is used to detect corners using covariance matrix

S2: The detected corners between the database and query image are used to find cross correlation coefficient

S3: If the number of correlation coefficients between the detected corners of the two images is greater than a threshold value then the candidate is accepted by the system

e) Matching:

Two irises are determined to be of the same class by a comparison of the feature vectors, using a Daugman like X-OR operation. Finally matching would be done of the iris. The matching would be done with the trained images. So that, if the images are matched and present in our database it shows the details of that person. Details such as his personal details, health details. If he is not matched with the database, then his details will be collected for further investigation, if it is needed.

V. CONCLUSION

This will provide the unique identification to the user.Effieciency will be more in the authentication.It will be more secure while accessind bank accounts and also in the hospitals for the patient details.Duplication will not be there in the authentication.

REFERENCES

[1] J. G. Daugman, "High confidence visual recognition of persons by a test of statistical independence," IEEE Trans. Pattern Anal. Mach. Intell., vol. 15, no. 11, pp. 1148–1161, Nov. 1993.

[2] J. Daugman, "How iris recognition works," IEEE Trans. Circ. Syst. Video Technol., vol. 14, no. 1, pp. 21–30, Jan. 2004.

[3] J. Daugman, "New methods in iris recognition,"IEEE Trans. Syst., Man, Cybern. B, Cybern., vol. 37, no. 5, pp. 1167–1175, Oct. 2007.

[4] A. W. K. Kong, D. Zhang, and M. Kamel, "An analysis of IrisCode", IEEE Trans. Image Process., vol. 19, no. 2, pp. 522–532, Feb. 2010.

[5] A. W. K. Kong and D. Zhang, "Competitive coding scheme for palmprint verification," in Proc. 17th Int. Conf. Pattern Recognit., 2004, vol. 1, pp. 520–523.

[6] A. K. Jain, S. Prabhakar, L. Hong, and S. Pankanti,"Filterbankbased fingerprint matching," IEEE Trans. Image Process., vol. 9, no. 5, pp. 846–859, May 2000.

[7] Z. Sun, T. Tan, Y. Wang and S. Z. Li, "Ordinal palmprint representation for personal identification," in Proc. IEEE Comput. Vis. Pattern Recog., 2005, vol. 1, pp. 279–284.

[8] L. Ma, T. Tan, Y. Wang, and D. Zhang, "Efficient iris recognition by characterizing key local variations," IEEE Trans. Image Process., vol. 13, no. 6, pp. 739–750, Jun. 2004.

[9] Z. Sun and T. Tan, "Ordinal measures for iris recognition," IEEE Trans. Pattern Anal. Mach. Intell., vol. 31, no. 12, pp. 2211–2226, Dec. 2009.

[10] L. Zhang, L. Zhang, D. Zhang, and H. Zhu, "Online fingerknuckle-print verification for personal authentication," Pattern Recognit., vol. 43, pp. 2560–2571, 2010.