Iris detection by alternative approach exploiting intensity parameters as well as dimensional characteristics

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Abstract: In present day world when identity circumferences many social, personal, professional outlooks, the identification of identity is highly critical. In pursuit of the same if we consider biological identity of person as a resource to identify his identity, we are approaching towards a new arena of a metric system call biometric system which enables us for automatic identification of an individual based on a unique feature or characteristic biologically possessed by the individual. Iris recognition is one of the celebrated technologies which are frequently finding its way into human life. Iris detection is the next step for iris recognition technology after pupil detection with MATLAB software version 2010b as the novel method to improve feature extraction.

Keywords: Iris Recognition, coordinates, intensity, co-centric, biometric, test/real-time input.

I. INTRODUCTION

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. In present day world when identity circumferences many social, personal, professional outlooks, the identification of identity is highly critical. [1, 2]

Iris recognition is an automated method of biometric identification that uses mathematical pattern-recognition techniques on images of the iris of an individual’s eyes, whose complex random patterns are unique and can be seen from some distance. [3, 4]

The first phase of iris biometric systems is capturing the sample of the iris. Then iris samples are pre-processed and segmented to locate the iris. Once the iris is located, it is then normalized from polar coordinate to Cartesian. Next, a template representing a set of features from the iris is generated. The iris template can then be objectively compared with other templates in order to determine an individual’s identity. This paper presents the novelty involved in first step for the segmentation pupil by determining coordinates of image [5,6,7].

II. EXPERIMENTAL RESULTS

The iris detection is followed by pupil detection module.

The sample images taken are:

![Sample Image 1](image1.png)

Figure 1: sample image 1

![Sample Image 2](image2.png)

Figure 2: sample image 2
Firstly an image is loaded and pupil is detected. The pupil detection module isolate the pupil from image, calculate the center and radius of pupil. The outputs achieved are then used in next module which is iris detection module.

1. Taking the outer most boundary coordinates into account obtained as output of pupil detection module, again put the image obtained in step 11 into loop by employing intensity criteria and the required coordinates of iris boundary having known the fact that in almost all cases bare exceptions the intensity of sclera is more than iris, whose intensity in turn is greater than pupil’s.
2. This boundary coordinates along with the center of pupil gives the radius of iris.
3. Thus iris boundary is drawn.

Input:

1. Grey Scale Image of eye to be compressed
2. Coordinates of center of pupil
3. Coordinates of boundary of pupil

Output:

1. X-coordinates of outer boundary
2. Y-coordinates of outer boundary
3. Radius of outer boundary

Fig. 6: Iris detection module

4. The outputs obtained in previous two modules are taken in account as input to the next level of module called eyelid detection module to obtain a noise free iris portion of the image.
In Iris detection module we examined the sample images for which the corresponding detected iris region is as follows:

Fig. 7: Boundary drawn on iris from sample image

Fig. 8: Iris detection (sample image 1)

Fig. 9: Iris detection (sample image 2)

Fig. 10: Iris detection (sample image 3)

Fig. 11: Iris detection (sample image 4)

Fig. 12: Iris detection (sample image 4)
CONCLUSION AND FUTURE WORK

The iris detection is effectively implemented by this new method and depending upon various dimensional features viz. distance of camera from iris, image quality of iris etc., the performance of our work varies in fairly good manner. We need not to extract iris region rather we have fairly segmented iris region with help of pupil dimensions. Moreover it comes to conclusion that its characteristic features of images pay off more in any biometric system along with the efficiency of operation performed. The future work involves reducing computational complexity of the above new algorithm.

REFERENCES