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ENHANCING IRIS BASED SECURITY SYSTEM USING EDGE DETECTION MECHANISM

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Abstract

An Iris Code is constructed by demodulation of iris pattern. This process uses complex-valued 2D Gabor wavelets to extract structure of iris as a sequence of phases, whose phase angles are quantized to set bits within first code. This courses is function within a duplicate dimensionless polar co-ordinate system that is surfaced to size of iris, and all surfaced to dilation diameter of pupil within iris.

Keywords: *Security, Pattern, 2D, 3D, Modulation, Demodulation,*

1. Introduction

Biometrics

Biometrics is technology of identifying human subjects by means of measuring & analyzing more than one intrinsic behavioural / physical traits. Such human body characteristics consist of fingerprints, eye retinas, voice patterns, irises, facial patterns & hand measurements. Biometric systems consist of applications that makes use of biometric technologies & allow identification & verification / authentication automatically.

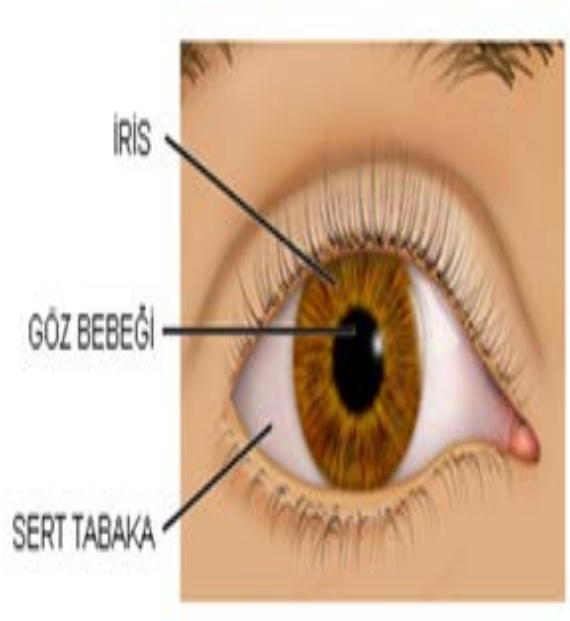

Figure 1: Iris of Eye

Introduction to Iris

Iris is a colored portion of eye & it controls size of pupil to regulate amount of light that enters through pupil. Average diameter of iris is 12 mm, & pupil size could vary from 10% to 80% of iris diameter.

Table 1: shows cross accuracy of different biometrics:-

Biometrics	Crossover Accuracy
Retinal Scan	1:10,000,000+
Iris Scan	1:131,000
Fingerprints	1:500
Hand Geometry	1:500
Signature Dynamics	1:50
Voice Dynamics	1:50

[#]Comparison of Biometrics Techniques

a) Iris Normalization

The size of pupil could change due to variation of illumination & associated elastic deformations within iris texture could interface with results of

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pattern matching. For purpose of accurate texture analysis, it is necessary to compensate this deformation.

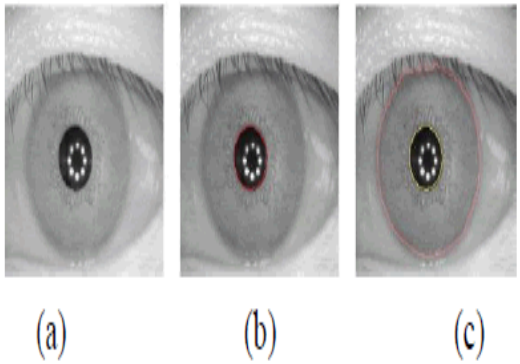

Figure 2: Introduction to Iris

2. LITRATURE REVIEW

Nesli Erdogmus & S´ebastien Marcel in 2015 Spoofing in 2D Face Recognition with 3D Masks & Anti-spoofing with Kinec

The use of solid range research of face to addition or supplant visible-light images in face against systems have been a subject of recent interest in biometrics community.

Sawati (2016) Enhancing Capability of Gang Scheduling by Integration of Multi Core Processors & Cache

Advantage of space sharing is elimination of multiprogramming, which eliminates context switching overhead. However, an equally clear disadvantage is time wasted when a CPU blocks & has nothing at all to do until it becomes ready again.

Pooja (2017) Review on Iris Based Security System Using Edge Detection Mechanism

Iris recognition is method of biometric to be identifying its use mathematical recognition techniques on video images of one or both of irises of an individual eye, whose difficult random patterns are unique, stable, & could be seen from some distance.

3. TOOLS AND TECHNOLOGY

Mathematical Explanation

An Iris Code is constructed by demodulation of iris pattern. This courses uses mosaic -valued 2D Gabor wavelets to extract structure of iris as a sequence of phases, whose phase angles are quantized to set bits within first code.

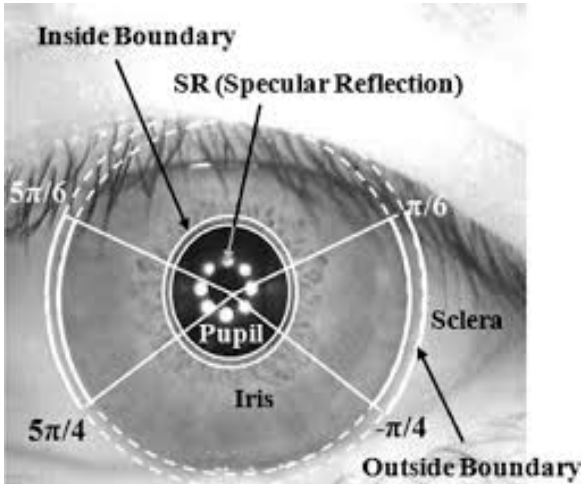

Figure 3: Mathematical reprentation of iris

MATLAB

Mat lab As a Simulation Tool

MATLAB is a high-performance language for technical computing. It integrates computation, visualization, & programming in an easy-to-use environment where problems & solutions are expressed in familiar mathematical notation. Typical uses include: Math & computation.

MATLAB (**mat**rix **lab**oratory) is a multi-paradigm numerical computing environment & fourth-generation programming language. Developed by Math Works, MATLAB allows matrix manipulations, plotting of functions & data, implementation of algorithms, creation of user interfaces, & interfacing within programs written in other languages, including C, C++, Java, Fortran & Python.

4. PROPOSED WORK

In order to improve & facilitate later processing, a primary processing is performed on iris images(pictures). In enhancing level Canny edge detection is used to enhance iris outer boundary that is not identified well within normal conditions, & a multiplier function is used to enhance Canny iris points, also image contrast adjustment is performed to make its pixels brighter.

5. IMPLEMENTATION

Step 1: Acquisation of image of iris: Scan image of eye / take it by digital camera

Figure 4: Original Image

Step2: Before comparison we crop image of eye

Figure 5: Eye After Crop

Step 3: Store image as matrix within i
>>i=imread('eye1.jpg')

Step 4

Apply canny to i matrix & store within ii
>> ii=canny(i,1,1,1)

Step 5

Create histogram using surf command
>>surf(ii)

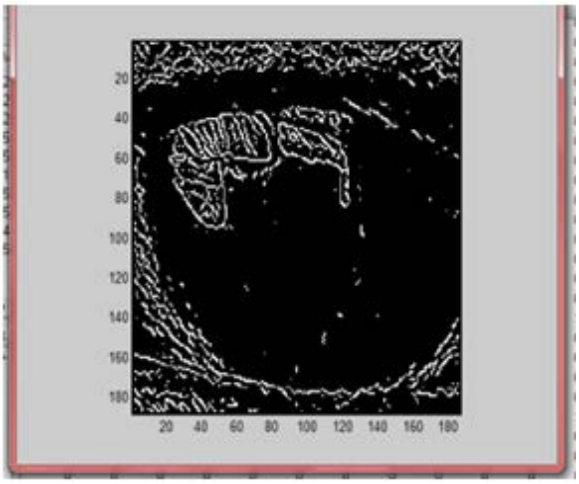

Figure 6: histogram using surf

Here we took the sample of eye1 and crop it using image processing tool. Then we applied edge detection mechanism in order to reduce the unnecessary part for comparison. The image is then stored in form of Matrix and a histogram is plotted.

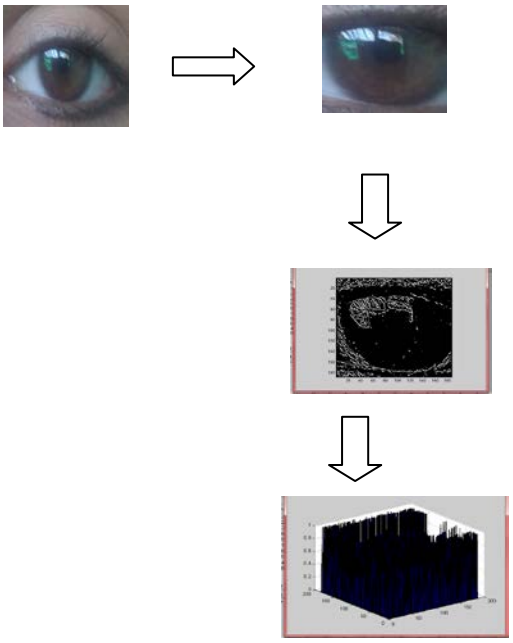

Figure 7: EYES 1

Here we took the sample of eye2 and crop it to eliminate unnecessary part using image processing tool. Edge detection mechanism to remove the unnecessary part for comparison is applied afterward. The image is then stored in form of Matrix and a histogram is plotted.

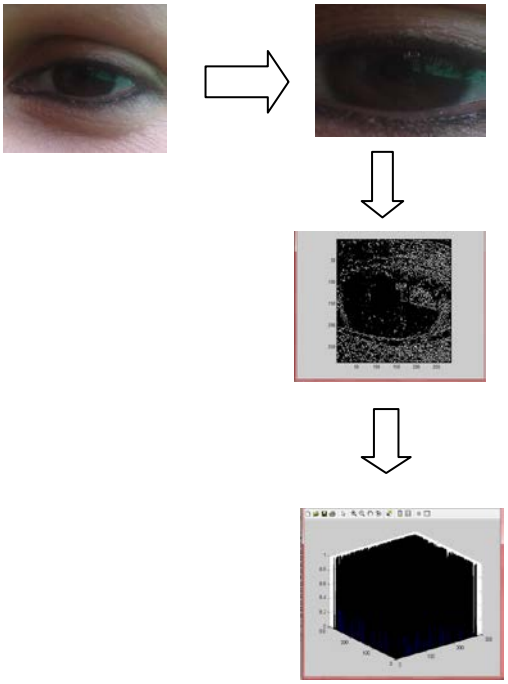

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Figure 8: EYES 2

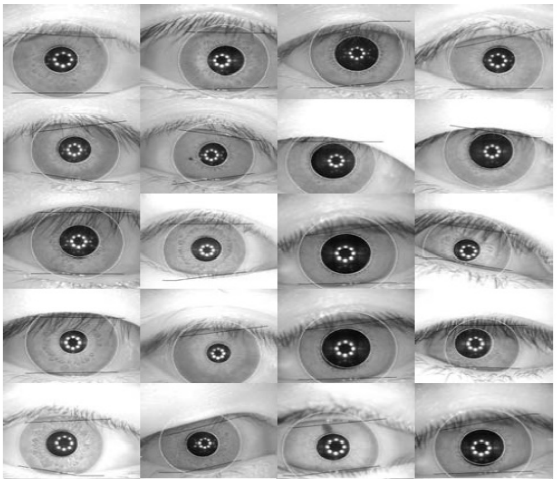

Figure 9: Iris boundaries localized for some eye images(pictures) (iris database: ASIA Iris Interval)

6. FUTURE SCOPE

In future iris recognitions process is found to be most secure as compared to other biometric techniques. It could be useful to enhance secure transaction within banks & other financial organization. However there are many challenges within frequent use of this technology but within future due to advent of new technology it would be possible to use this technology easily. Enterprise & government both acknowledge convergence of physical & information security environments, but there are new security challenges on horizon - just-in-time inventory control, sophisticated supply chain management, & even a phenomenon called "coopetition"-in that companies that compete within some areas, cooperate within others. Managing junction of physical & information security requirements now drives security system architecture design & implementation & is an increasingly key factor within biometric technology selection. Managing convergence would only become a more complex task because as IT & communications becomes increasingly wireless, there is a need for robust individuality management would become more acute. Iris ID sees iris technology as a natural "fit" for within physical, & wireless arenas. This growing need, as well as Iris ID competence within iris technology, coupled with core interests within IT & wireless, provides impetus for design efforts for future - & makes Iris ID one to watch for new developments within individuality management tomorrow & beyond.

7. CONCLUSION

The technical performance capability of iris recognition process far surpasses that of any biometric technology now available. Iris identification process is defined for rapid exhaustive search for very large databases: distinctive capability required for authentication today. Extremely well low possibility of getting a false match enable iris recognition algorithms to search through extremely large databases, even of a national / planetary scale. As iris technology grows less expensive, it could very likely unseat a large portion of biometric industry, e-commerce included; its technological superiority have already allowed it to make significant inroads into identification & security venues that had been dominated by other biometrics. Iris-based biometric technology have always been an exceptionally accurate one, & it could soon grow much more prominent.

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