IRIS RECOGNITION

Abstract:

There are many a significant number of security systems around the world which proved their Worth in a while,Among them IRIS scanner has an remarkable importance in making it function differently and even more efficiently which has an minute error rate and even more faster while coming to identification of users or images standing near by the camera in the measured distance that the IRIS scanner can recognize and thus makes it easier. there would be some non favourable conditions such as blurring of an IRIS image may occur due to long distances and thus chances of recognition decreases .these IRIS Scanner has an vast number of applications.there occurs a negative impact regarding IRIS scanner when the disturbances occurred

Introduction:

In the world filled with advancement regarding privacy and security and easy accessing, people are using E-Cards and thus feeling it as more secured, but the cards maintanance may include some of complex situations like forgetting the pin or particular details.so by using an unique identifiers like physical or behavioural characteristics thus for reducing complexity those are called as biometrics.Biometrics include Retina ,Fingerprint,Voice ,Face recognition etc as they are different for every individual making it prevail around the world

History:

For the purpose of security and other prioritized reasons the proposal of IRIS recognition took place in 1987 by two ohpthalmologists named Flom and Saffir but it wasnt an successful one as they proposed IRIS recognittion without any Algorithm ,Later Another proposal was came through scientis named John Dougman in 1994 with an working algorithmand the details regarding algorithhm are even published in an article thus even today we people makes research on IRIS recognition on the basis of that algorithm.

Propsed methodology:

Fjjor the past 5 to 6 years there are many a different approaches were advertised and came into lame light regarding the working structure and grasping speed that is fast recognition. based on many a research we have comsidered the basic works that have been performed by scientists namely Lye Wi Liam, Ali Chekima, Liau Chung Fan in 2002 made a research regarding iris and iris patterns by taking a photo and extracting or removing the iris and recognizing the iris patterns by arranging them in rectangular patterns

Motion cameras came into Existence and thus recognizing the iris patterns became even more

easy and these IRIS recognition almost alows to find all the breif information ,in general the recognition patterns plays an prominant role in using bit patterns of an individual.

Working practice:

In general Iris scanning consists of two stages those are: 1) Enrollment: first time making your IRIS patterns to get stored 2) Verification: When u are to be entered after a particular instance of time thus for checking whether its u or not

the world without a ticket and without a visa(or)a passport. Login:From entering passwords to unlocking any device using your eye world has developed to an extent.

2.Fast Fourier Transform

FFT tries to divide an image into two parts.

1.Real

2.Imaginary components,

which is a representation of frequency domain. FFT is helpful in splitting frequencies so that we can compare and perform different operations.It can be expressed in terms of sine and cosine functions.

Y=ff(x) is the input function.Thematlab returns discetefouriertrasnform(DFT) of vector X. (DFT) is sent to FFT algorithm for improvisation.

Complexity of DFT is given by O(N^2) and that of FFT is D(NlogN). The vector is divided into two

halves and performs its actions. In the end,the results are computed together.

3.MOMENT OF INERTIA:

Moments show difference between the shape and size of the image. It can be perimeter,centroid,MOIetc;.

The image F(X,Y) is taken as an object. For M*M image, the (i,j)th moment of the image F(X,Y) is defined as :
The moment(0,0) is the mass of the object. First order moments are M(0,1) and M(1,0).Let X and Y be centroids.

X'=m(1,0)/m(0,0) ,
Y'=m(0,1)/m(0,0).

These are less useful since they may vary due of change of positions with respect to the origin. The invariant moments are calculated.

Normalized central moments are given by :

The orientation of any object is defined as the angle of axis of the minimized MOI.

3.MATCHING
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The Euclidean distance is calculated for both the eye images. The normal is calculated for two vectors.Let X1 and X2 be X-axis moment values and Y2 and Y1 be the Y-axis moment values.

Distance=sqrt[(X2-X1)^2 + (Y2-Y1)^2]

4.ALGORITHM
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CSAIA database is used to store the images of eye

steps:

1) import the image of eye. 2) the image is changed to grayscale using matlab code. 3) code finds FFT point sequences in a image. 4) normalized moment of FFT point sequence set are generated. 5) compare them with another image. 6) calculate Euclidean distance for dividing lowest distance.

7) repeat. AFTER COMPARING

5 IMAGES:

NO MOMENT VALUES MOMENT VALUES DURING MATCHING DIFFERENCE MATCH

1 3245642 3245641 1 yes 2 6179244 6179245 1 yes 3 4721923 4721926 3 yes 4 9172477 9172480 3 yes 5 6189908 6189902 6 yes

RESULTS:

the moments are calculated and difference should not be less than 1000.
it is 100% accurate than face recognition.

Photo:

The system first of all needs to scan the eyes properly.if the eye is a blue coloured eye then the eye has less amount of melanin.If the iris scanner does not scan the eye properly the algorithms that are designed will not work properly.This process is called as Enrollment.Every person has to get their eyes scanned and the eyes will be digitally scanned with both ordinary light and IR light.These two digital photographs are scanned and then the unwanted data like the limbus part will be removed.After the removal of unwanted material the system will use the algorithms and converts into a 512 digit number called as the IRISCode in the database.the next time when you want to access any kind of data with a glance you can access it.

Verification :

After the storing of the iris,a person can easily verify by simply standing in front of another scanner to verify if the iris is stored.Once the person stands in front of the scanner,the system checks for the similar iris in its database where hundreds of the other iris are stored.If the iris that is stored in the database matches with yours kaboom!!.If not try again.
The scanner takes the image of the entire eye and draws two circles,one is the inner one where the scanner takes the iris part and the other circle which generally removes the libus part between the iris.

After this there will be concentric circles and radial lines from their origin to seprate the analysis zone.The scanner actually waits for some time so that the iris dilates and shrinks according to the light conditions so that it work better even in a bad or bright light conditions.Then the system converts the iris into a special unique code .But even though the light conditions are different the code that is generated by the system will be almost the same. IRIS Review :

While talking about identification techniques iris also falls into one of the identity authentication. All the fingerprint access,facial recognition and many more authentications present simpler ways of accessing their data.During the 1980's two people Flom and Safir bought the patent on the concept of " Automated IRIS System where no two irises are homogeneous" .

In matching two irises,Daugman's proposal involves calculation of the Hamming distance between the iris codes.Matching is achieved over an application of normalized correlation or a comparability measure.Using Hamming distance algorithm the scanner matches the textural and topological databases.Using this method false irises are detected and can be picked out easily.

Applications :

Some of the current and upcoming applications of the Iris recognition National Border Usage:Using iris as a passport Payment:Online payment through mobiles and having the iris as a password or the authentication. Internet security:Accessing the data that is stored in the cloud with a blink of the eye. Travelling:With a simple glance of your eye you can travel around the world without a ticket and without a visa(or)a passport. Login:From entering passwords to unlocking any device using your eye world has developed to an extent.

ADVANTAGES AND DISADVANTAGES:

ADVANTAGES :

1.Fast:

The total scanning operation takes just a few seconds.

2.Non-INTRUSIVE:

There is no need physical contact to perform this process.This process is not intrusive at all.

3.Non-Invasive:

There is no need for laser technology to scan the iris making it a non-invasive .

4.Hard To Forge:

The whole iris recognition system is forge by any means.This is biometric and is deployed in many countries.

5.Engagement:

The iris camera can’t record an iris without the subjects proper engagement.

DISADVANTAGES :

1.Expensive:

As one of the leading modern security solution making it high cost and can’t afford easily.

2.Distance:

As iris size is small so it does not work efficiently in long distances.thus making it difficult to scan iris from longer distances.

3.Movement:

A person has to be in steady in front of the scanning device as it can’t scan the iris which is in motion thus making it difficult to scan the iris.

4.Infrared light:

The maximum use of the iris scanner makes it harm for iris as it consists of Infrared

light.

COMPAIRISIONS:

IRIS vs FINGERPRINT:

Fingerprint recognition is a popular security solution in the modern generation of technology and is a well-known biometric technology. Since Many of the technological giants introduced iris recognition feature in its smartphones, there were comparisons between these two biometric traits.

IRIS vs FINGERPRINT:

With iris recognition system the total scanning process just takes a few seconds to complete.

1. Face id doesn’t work while the phone is kept in a vertical way (Landscape orientation) 2. It needs to scan the whole face 3. Strong direct sunlight can blind the face id camera 4. Face id can be fooled.It can be fooled by identical twins. 5. Like all other biometrics,is about identity than security.

CONCLUSION:

In order to avoid all the crime activities and fraud activities and for Anti-terrorism, we should use Iris technology.It is highly unique security feature adding it more strong security.

With Sincere efforts of Mine,

N.V.AKHIL