

Comparison Between Iris And Other Biometric Traits Recognition System

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Abstract- Iris recognition is such type of a biometric system which is generally used for providing security and identification of any person. Generally a biometric system consists of detection, feature extraction, sensing and matching modules. There are many biometric traits are available for identification out of which Iris recognition is more reliable and accurate biometric systems for personal identification. As it has very high reliability and higher perfect recognition rates and also more uniqueness iris recognition system can be used where high security is needed like ATMs, bank lockers, mobile phones and online transactions. In this paper, performances of various biometric traits are compared with iris recognition.

Keywords- Iris Recognition Feature extraction Pattern Matching Cooperative and Non-cooperative

I. INTRODUCTION

Iris recognition has become accurate and reliable biometric technology. Five fundamentals modules of iris recognition systems: image acquisition, segmentation, social control, encryption and matching. These systems work in completely different steps and will establish a personal based mostly on the iris characteristics. Multi biometric system is safer than single biometric system. This is often accustomed establish the person on their activity and physiological characteristic (for example fingerprint, face, iris, key-stroke, signature, voice, etc.). A typical biometric system consists of sensing, feature extraction, and matching modules. The best biometric traits considering the standard properties of generality, permanence, collectability, performance, satisfactoriness and escape.

Table 1. Properties of biometric traits.

Traits	Uniqueness	Universality	Permanence	Collectability	Performance	Acceptability	Circumventi
DNA	87%	95%	94%	19%	19%	15%	55%
Ear	46%	58%	85%	50%	53%	100%	50%
Face	44%	92%	50%	84%	25%	99%	37%
Fingerprint	78%	47%	91%	62%	98%	49%	71%

Hand Geometry	54%	57%	54%	78%	50%	67%	59%
Iris	96%	93%	97%	62%	98%	50%	95%

Iris recognition has been thought to be one in every of the foremost promising technologies to supply reliable human identification [K. Bowyer et. al]. Iris recognition system was initial enforced by John Daugman, his system is proprietary and winning with correct recognition rate of one hundred, however afterward several different systems have developed [10]. Daugman’s algorithmic program planned the Iris model as two circles between the Pupil and albuginea boundaries that are not essentially coaxial [5]. The review of iris segmentation in literatures reveals two major approaches: Daugman’s integro-differential operator and Hough’s transform-based. There are totally different options like Fingerprint, Retinal Scan, and Iris scan Hand pure mathematics and Face recognition [4]. These square measure the most important life science systems. This square measure employed in numerous applications like ATM, cellular phones, secure access to a building. This survey paper covers the various iris recognition techniques and ways. A general approach of iris recognition system includes image acquisition, segmentation, feature Extraction, matching and classification.

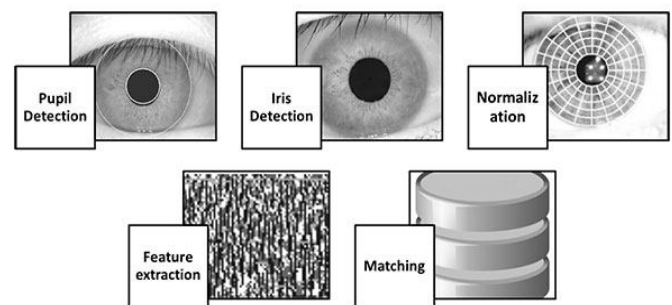


Figure 1. Process of IRIS Recognition

The iris recognition methodology uses either a color, black and white, or infrared camera to require pictures. The standard of the no inheritable pictures could be a major consider the success of the Iris recognition

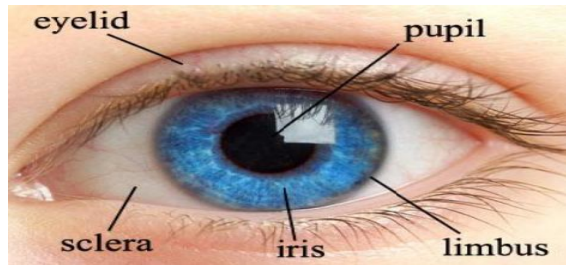


Figure 2. Eye Image

The iris could be a combination of many components Iris recognition is one amongst the foremost effective biometric techniques used for security functions . Comparison of some biometric strategies with iris recognition is given as:

Finger print Vs Iris recognition: -

Both have some common characteristics and each square measure reliable and correct however iris recognition system is best than fingerprint

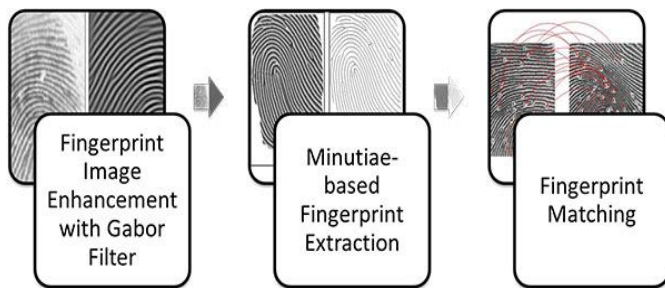


Figure 3. Steps involved in fingerprint recognition

Fingerprint technology has been widely used within the law enforcement community and in the AFIS database. Thus it is a very popular biometric technology and also widely accepted. However, fingerprint readers may not be sufficient to handle the large variation in populations that need to be enrolled. Fingerprint technology works best for background check applications. Iris recognition has a very high accuracy rate and is also a non-invasive biometric technology

Voice recognition Vs Iris recognition: -

Voice recognition is a smaller amount accurate than iris recognition system attributable to terribly high error rate (1 in 50) as compared to the error rate (1 in 131,000) of iris recognition system. An illness such as a cold can change a person’s voice, making absolute identification difficult or impossible.

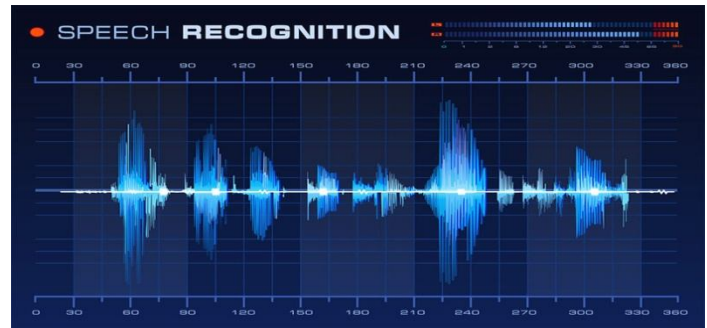


Figure 4.

Another disadvantage of Voice recognition is a person’s voice can be easily recorded and used for unauthorized PC or network and it has Low accuracy.

Face recognition Vs Iris recognition: -

Face recognition is additionally non-intrusive like iris recognition however less reliable than iris recognition because of low level of stability in face.

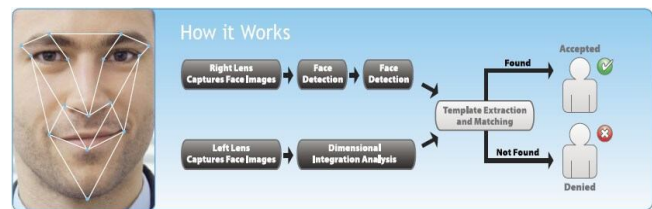


Figure 5.

Major disadvantage of face recognition is 2D recognition is affected by changes in lighting, the person’s hair, the age, and if the person wear glasses

DNA Vs Iris recognition: -

Human DNA is the genetic material that can be found in each body cell of an individual. There are number of sources from which DNA patterns can be collected such as blood, saliva, nails, hair and others. The collected DNA samples are fragmented into shorter fragments which are organized by size and are then compared. Still this technology is not automated and need to be refined.

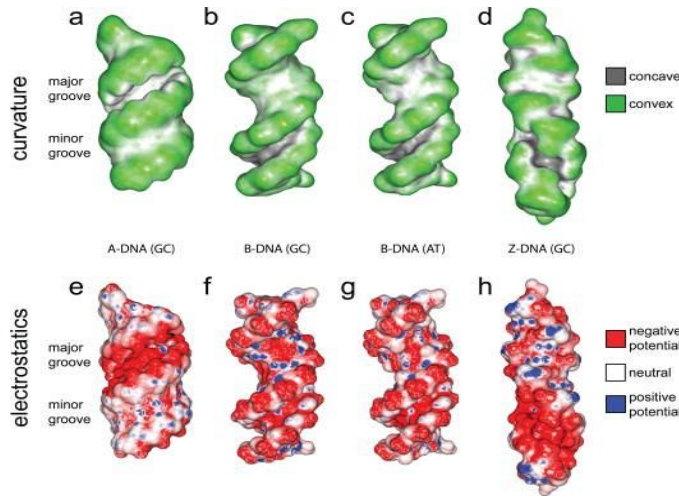


Figure 5. Molecular shape and electrostatic potential of A-DNA, B-DNA, and Z-DNA

Compare to Iris in DNA recognition more storage is required and it is not a automatic technique.

Hand geometry Vs Iris recognition: -

Hand pure mathematics is straightforward to use and cheaper however less correct than iris recognition system as a result of error rate of hand pure mathematics is one in five hundred that is incredibly high as compared to iris recognition system(1 in 131,000).

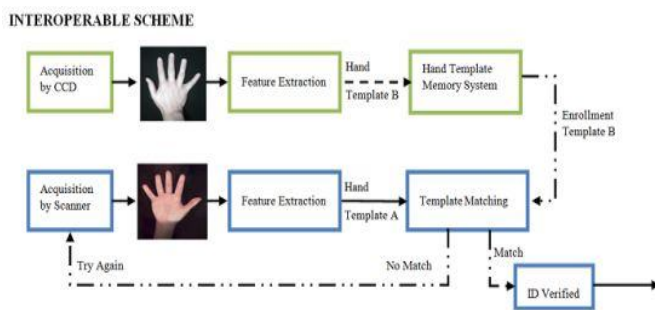


Figure 5.

As compared to Iris it has more false acceptance rate and crossover error rate. It is not valid for arthritic person, since they cannot put the hand on the scanner properly.

When a person's identity should be established or confirmed, iris recognition is that the most reliable nonintrusive biometric technique to bank on. Fuzzy approaches supported k-Means and Run Length cryptography (RLE) [11]. Gabor Analytic Iris Texture Binary Encoder (GAITBE) is introduced showing that correct recognition of comparable iris pictures are often achieved examination the binary iris codes. a brand new approach to iris recognition supported CFIS and GAITBE. Eye chase and head movement

detection square measure wide investigated as various interface strategies

II. LITERATURE REVIEW

[Abbasi Asima Akber, et. al., (2013)] has worked on appraise completely different iris recognition techniques for each cooperative and non-cooperative databases. Strengths and weakness of various techniques area unit known area. This work involves detection of iris and pupil boundary, elimination of lid, lash and reflection areas in lesser time is tougher tasks for off angle pictures. To beat these downside researchers divided associate iris image in to multiple regions. Matching of little portion will determine a private that will increase the system accuracy. [Shende Pradnya M., et. al., (2014)] has planned 3 biometric techniques that area unit face recognition, fingerprint recognition, and iris recognition (Multi Biometric System) and additionally introduce the attacks thereon system and by exploitation Image Quality Assessment For physiological property Detection a way to defend the system from faux bioscience. owing to Image quality measurements it's straightforward to seek out of users as a result of fake identities forever have some different options than original it forever contain different color and luminosity levels, general artifacts, amount of data, and amount of sharpness. [Arulalan V., et. al., (2014)] has worked on completely different bioscience techniques like Fingerprint, Iris Scan, Retinal Scan, Face Recognition, Hand pure mathematics, Voice and Signature area unit offered to implement a biometric system. These systems will method solely in presence of person. Thus these biometric systems area unit established to be extremely secured system. It has worked on the common strategies of Iris Recognition on with some feature extraction techniques and matching strategies. This paper can facilitate in future in selecting the simplest best methodology for Iris Recognition. in order that we'll get high accuracy rate, less False Acceptance rate and fewer False Rejection rate. [Sharma Lokesh, et. al., (2014)] has planned on someone is known by variety of how. In bioscience have variety of characteristics that area unit exploitation in our recognition technology as fingerprint, palm print, signature, face, iris recognition, and thumb impression and then on however among these irises recognition is best technology for identification of someone. It provides a review of major iris recognition researches. Comparison table of techniques of various iris recognition algorithmic rules is additionally conferred in short. [Vatsa Mayank, et. al., (2004)] has worked on comparison of four algorithms that shows that algorithm offers most accuracy. These are working to develop an efficient algorithm for iris recognition using less expensive cameras and other hardware so that the cost can be reduced unto some extent. The algorithms square measure typically

divided into four steps, viz. Localization, standardization, Feature Extraction and Matching. [Al-Rahayfeh Amer, et. al., (2014)] during this paper presents a state-of-art survey for eye chase and head movement detection ways planned within the literature. Samples of totally different fields of applications for each technologies, like human laptop interaction, driving help systems, and helpful technologies are investigated. Eye chase ways seldom investigate the specified electronic equipment time. However, period application needs investigation and optimizing the performance needs. [Agarkar P.M., et. al., (2013)] has worked on differing types of databases and complicated patterns of the iris texture. Typical Iris Recognition System follows six steps, Image Acquisition, Preprocessing, Feature Extraction, Iris committal to writing, Matching and Result Generation. Matching are done by mistreatment varied databases like UBIRIS, CASIA, and MMU2 etc. conjointly this paper can mention some ways of Iris Recognition. [Tan Chun-Wei, et. al., (2014)] during this paper details the event of a brand new anti-spoofing approach that exploits the applied mathematics grey-level dependencies in each the localized and world eye regions encompassing iris. We have a tendency to gift experimental results on publically out there faux iris image information. the proper classification rate of ninety nine.75% is obtained from the developed spoof iris detection approach mistreatment 1200 real and pretend iris pictures and read-only memory a publically out there information. During this paper, totally different iris recognition ways that aid Associate in nursing applicable outlook for future work to build integrated classifier on latest input devices for wonderful business transactions square measure mentioned. Benchmark databases, merchandise are mentioned. Since the world is presently one in all the foremost on the go and therefore the bulk of analysis is extremely massive, this survey covers a number of the numerous ways. [B K Meenakshi, et. al., (2014)] during this paper, review of assorted segmentation approaches utilized in iris recognition is finished here. Overall segmentation accuracy of these techniques has been analyzed. Higher the segmentation rate, therefore higher is its performance

III. ACKNOWLEDGMENT

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REFERENCES

- [1] Abbasi Asima Akber, Khan M.N.A., Khan Sajid Ali (2013) "A Critical Survey of Iris Based Recognition Systems", A Critical Survey of Iris Based Recognition Systems, pp. 663-668.
- [2] Agarkar P.M., Talbar S.N. (Jan 2013) "Fast Iris Searching Methods, Databases and Complex Patterns", International Journal of Computer Science & Information Technology Volume 3, pp. 22–25.
- [3] Al-Rahayfeh Amer, Faezipour Miad, (July 2013) "Eye Tracking and Head Movement Detection: A State-of-Art Survey", IEEE, Volume 1, pp. 2168-2372.
- [4] Arulalan.V, Balamurugan.G, Premanand. V, (Feb 2014) "A Survey on Biometric Recognition Techniques", International Journal of Advanced Research in Computer and Communication Engineering, Volume. 3, Issue 2, pp. 5708-5711.
- [5] B K Meenakshi, M R Mrs. Prasad, (Apr 2014) "Survey on Segmentation to Iris Recognition System", IJSR, Volume 3 Issue 4.
- [6] Sharma Lokesh, Thakur Gautam (Aug 2014) "An overview and examination of iris recognition Algorithms", IJARCSMS, Volume 2, Issue 8, pp.152-160.
- [7] Sachdeva Gourav, Kaur Dr. Bikrampal, (Apr 2015) "An Analytical Study On Iris Recognition System: A Survey", International Journal of Engineering Research and General Science, Volume 3, Issue 2, pp. 849-853.
- [8] Sheela S V, Vijaya P A, (June 2010) "Iris Recognition Methods - Survey", International Journal of Computer Applications, pp. 0975-8887.
- [9] Tan Chun-Wei, Kumar Ajay, (2014) "Integrating Ocular And Iris Descriptors For Fake Iris Image Detection", IEEE, Volume 2.
- [10] Vatsa Mayank, Singh Richa, Gupta P. (2004) "Comparison of iris Recognition Algorithms", IEEE, pp. 354-358.7/00/0010.