

Survey on Various IRIS Recognition Techniques

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Abstract- Iris recognition is a biometric system used either for security purpose or to identify any person. A typical biometric system consists of feature extraction, sensing and matching modules. Iris recognition is one of the most reliable biometric systems for personal identification. Due to its reliability and perfect recognition rates it can be used in high security areas like ATMs, landing field security, cellular phones and secure access to a building. In this paper, performances of various segmentation and extraction methods are analyzed for iris recognition.

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

I. INTRODUCTION

Iris recognition has become combine correct and reliable biometric technology. There square measure 5 fundamentals sections of iris recognition systems: image acquisition, segmentation, social control, encryption and matching [1]. Iris recognition systems work in completely different steps and will establish a personal based mostly on the iris characteristics. A biometric system could be a computer system. 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.) [8]. A typical biometric system consists of sensing, feature extraction, and matching modules. The best biometric traits, considering the standard properties of singularity, generality, permanence, collectability, performance, satisfactoriness and escape. 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].

Table 1:- Properties of biometric traits.

Traits	Uniqueness	Universality	Permanence	Collectability	Performance	Acceptability	Circumvention
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%

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.

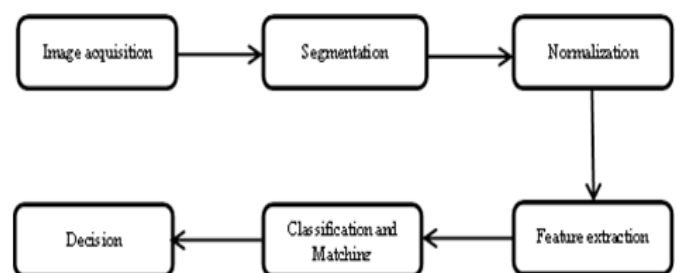


Figure 1: Process of IRIS Recognition

Iris recognition systems had been developed in literatures.

- **Image acquisition:** Image acquisition deals with capturing sequence of iris pictures from the topic victimization cameras and sensors. During this stage, a photograph is taken from iris.
- **Pre-processing:** Edge detection, distinction adjustment and number are wiped out this stage.

- **Segmentation:** Iris recognition is to isolate the iris portion from the eye image, known as segmentation. It's a method required to isolate and exclude the artifacts moreover as locating the circular iris region localization of iris inner and outer boundaries and localization of boundary between iris and eyelids square measure exhausted segmentation.
- **Normalization:** The normalization method can turn out iris regions that have identical constant dimensions, so two pictures of identical iris underneath totally different conditions can have characteristic options at identical abstraction location. Transformation from polar to mathematician coordinates and normalization of iris image.
- **Feature extraction:** In order to convey correct recognition of individuals, the foremost discriminating information gift in Associate in nursing iris pattern ought to be extracted noise removal from iris image and generating iris code.
- **Classification and matching:** comparing and matching of iris code with the codes already saved in information.

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.

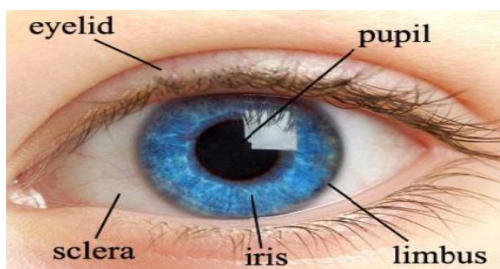


Figure 2: Eye Image

Iris recognition has become a well-liked analysis in recent years. iris recognition is most reliable technique as compared to all or any different strategies attributable to its blessings like dependableness, stability etc. [6]. the varied application mistreatment biometry are passports, driving licenses, banking, refraining imposters from hacking into networks, stealing mails etc. the most blessings of iris recognition are terribly high accuracy and verification times takes but five seconds. The disadvantage of this recognition are value is high, an excessive amount of movement of head and use of color lens system [2]. The iris could be a combination of many components Iris recognition is one

amongst the foremost effective biometric techniques used for security functions [7]. Comparison of some biometric strategies with iris recognition is given as:

- **Finger print Vs Iris recognition:** - Both biometric strategies have some common characteristics and each square measure reliable and correct however iris recognition system is best than fingerprint.
- **Voice recognition Vs Iris recognition:** - Voice recognition is a smaller amount correct 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.
- **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.
- **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).

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 [3].

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. CONCLUSION

Iris recognition system has become widely used reliable biometric technology, during study multiple techniques have been discussed to recognize cooperative, noisy, off angle, blurred and occluded images. This work comes to conclusion that iris segmentation is an essential part of recognition system. Detection of iris and pupil, elimination of eyelid, eyelash and reflection areas in lesser time is more challenging tasks for off angle images.

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