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Fraud Detection of Credit Card Using Iris Technique: A Survey

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Abstract - *An overview of literature is based on the iris recognition. Iris technique is a unique and popular technique for personal identification and verification. Human iris has distinct pattern of retinal blood vessels. Person to person biometric identification is in different form. Due to reliability and perfect recognition rate, iris recognition is used in high security areas. Now there is increase in fraud over internet. During last few years, various iris recognition techniques algorithms have been proposed for efficient and effective recognition algorithm. An overview of algorithms of iris recognition is given in order to increase the high accuracy.*

Key Words: iris recognition, iris identification, iris verification ,Security, feature points

1.INTRODUCTION

Developing a high end security system for identification or authentication purpose have always been an active research area and attractive goal in almost all fields.

Traditional security systems provide security to a process or a product with the help of "something that we have or we know", such as a key or a password, whereas a biometric security system uses a person's physical or behavioral traits. Physiological or behavioral traits of a person may include, but not limited to the following: face, finger print, iris, retina, voice, DNA, gait, etc.

There are many applications of biometrics each has its own pros and corns according to the requirements on biometric identifiers. A practical biometric system should have acceptable recognition accuracy, speed with reasonable resource requirements. It should be harmless to users, be accepted by the intended population, and be sufficiently robust to various fraudulent methods [7]. For a long time the fingerprints have been one of the most widely used and accepted biometric. This is proved by the Chinese who have used fingerprints to sign documents for over 1000 years [14].

Computer vision-based techniques that recognize human features like faces, finger prints, palms, and eyes have many applications in environment and security purpose. Most of the existing methods have limited ability to recognizing relatively complex features in realistic practical situations.

The objective of this resemblance is to present a new approach for recognizing humans from images of the iris of the eyes under practical conditions. This is then used for the security purpose. The iris has matchless features and is complex enough to be used as a biometric. This means that the possibility of finding two people with identical iris patterns is almost zero. Hence, the use the iris pattern for identification, it is important to define a representation that is well adapted for extracting the iris information content from images of the human eye.

Iris recognition is a method of recognizing a person by analyzing the iris pattern. Iris pattern are formed by six months after birth. Iris pattern remains stable after a year and remain the same for life time that means it does not have aging effect. Iris patterns of identical twins differ and a person's left and right eyes have distinct patterns as well. This distinguishes it from fingerprints or palm print, which can be difficult to recognize after years of certain types of manual labor [7]. It is considered as the most reliable biometric technology since iris is highly distinctive and robust.

The iris is highly protected internal organ of eye. Iris patterns possess a high degree of randomness.

- variability: 244 degrees-of-freedom
- entropy: 3.2 bits per square-millimeter
- uniqueness: set by combinatorial complexity

Iris Patterns apparently stable throughout life. Iris have Limited genetic penetrance of iris patterns.

Iris may deforms non-elastically as pupil changes size. It also Obscured by eyelashes, lenses, reflections and Some negative connotations are also problem with the iris recognition.

2. OVERVIEW OF ALGORITHMS

Different iris recognition algorithm have been proposed amid most recent couple of years as examined underneath.

Mrs Sayalee P. Deshmukh, Dr S.H.Patil et al. [1] had proposed an architecture based on Iris Biometric Technique is a new concept and it is very useful for decrease Frauds in credit cards over Internet. This technique is use for the security purpose. Firstly, it makes pre-process to iris image, assure the effective iris area adaptively. Secondly, it finds all

iris feature points by directional information, length information, and width information of texture, the neighbouring gray information and relativity in the effective iris area. Thirdly, feature points converted into codes and figures the iris pattern by iris codes. Finally, sorts the different iris patterns by automated pattern matching method and gives the recognition results. This iris recognition technique find the iris characteristic point in a short time, the recognition rate is high, and the recognition speed is guaranteed. Now many recognition techniques have been developed and some commercialized systems are available. In this inner pupil part and outer iris part are in the iris images. Experimental results show that this technique of localization algorithm is efficient and improves the accuracy of iris recognition.

J. Daugman et al. [2] had worked on A method for rapid visual recognition of personal identity , based on the failure of a statistical test of independence. The most unique feature visible in a person's face is the detailed texture of each eye's iris. In real-time video the visible texture of a person's iris is encoded into a compact sequence of multi-scale quadrature two dimensional Gabor wavelet coefficients, whose most-significant bits consist of a 256 byte "iris code." Statistical decision theory generates identification decisions from Exclusive- OR comparisons of complete iris codes at the rate of 4000 per second, including calculation of decision confidence levels. The distributions seen empirically in such comparisons imply a theoretical "cross-over" error rate of one in 131000 when a decision criterion is adopted that would equalize the false accept and false reject error rates. When we require to know with certainty who an individual is, or whether he is who he claims to be, we normally rely either upon something that he uniquely possesses ex. key, something that he uniquely knows ex. password or PIN, or a unique biological characteristic ex. his appearance. Technologically the first two of these criteria have been the easiest to confirm automatically, but they are also the least reliable, since they do not necessarily make this individual different from all others. For purposes of rapid and reliable personal identification, the first and third of these cannot readily be exploited: DNA testing is neither real-time nor uncalled for; and experiences are only as secure as testimony.

J. Daugman et al. [3] had proposed a Samples from stochastic signals having sufficient complexity need reveal only a little unexpected shared structure, in order to reject the hypothesis that they are independent. The bound failure of a test of statistical independence can thereby serve as a basis for recognizing stochastic patterns, provided they possess enough degrees-of-freedom, because all unrelated ones would pass such a test. This paper discusses utilization of this statistical principle, combined with wavelet image coding methods to extract phase descriptions of incoherent patterns. Demodulation and coarse quantization of the phase information creates decision environments characterized by well-separated clusters, and this lends itself to rapid and reliable pattern recognition.

R. Wildes et al. [4] had taken a work on automatic iris recognition based on technology for personal identification and verification. The motivation for this attempt stems from the observation that the human iris provides a particularly interesting structure on which to base a technology for noninvasive biometric assessment. In special, the biomedical literature suggests that irises are as different as fingerprints or patterns of retinal blood vessels. Further, since the iris is an overt body, its appearance is declare to remote examination with the aid of a machine vision system. This paper gives details issues in the design and operation of such systems.

W.Boles, B. Boashash et al. [5] had built up new approach for recognizing the iris of the human eye by using Zero-crossings of the wavelet transform at various resolution levels are calculated over concentric circles on the iris, and the resulting 1-D (one-dimensional) signals are compared with model features using different dissimilarity functions. A new algorithm for recognizing the iris of the human eye based on the wavelet transform is presented. The algorithm is translation, rotation, and scale invariant. It is also insensitive to contrast in the lighting conditions and noise levels. It specifically uses the zero crossings of the wavelet transform of the unique features obtained from the grey-level profiles of the iris. It uses only a few selected intermediate resolution levels for matching, thus making it computationally capable and less sensitive to noise and quantization errors.

J. Daugman et al. [6] proposed recognition approach of human by their iris patterns is the failure of a test of statistical independence on texture phase structure as encoded by muitiscale quadrature wavelets. The combinatorial complexity of this phase information across distinct persons spans about 249 degrees of freedom and generates a discrimination entropy of about 3.2 bits/mma over the iris, starting real-time decisions about personal identity with extremely high confidence. Algorithms first described by the author in 1993 have now been tested in several independent field trials and are becoming widely licensed.

Nirali M. Bhagwagar, Yagnik A. Rathod [7] present an overview of all different iris recognition techniques and methods. The Iris recognition is a method of recognizing a person by analyzing the iris pattern. Iris recognition is automatic identification of an individual that has been research interest for last few years. Through this paper the relevant work done in this area is presented.

Different iris segmentation and feature extraction methods each one having its own advantages and disadvantages is overviewed. From this review it is concluded that iris recognition for eye images which are taken from a distance

and under less constrained environments creates several problems, especially for the images taken using visible imaging. Image quality degradation is usually undesirable in the visible illumination eye images acquired from such changing environments. Therefore the need is to develop iris recognition algorithm to operate on iris images which are taken under visible or near infrared illumination.

Yingzi Du, Robert Ives, Delores Etter, Thad Welch [8] present an iris identification algorithm is based on adaptive thresholding. The iris images are processed fully in the spatial domain using the distinct features of the iris. A simple adaptive thresholding method is utilized to segment these patterns from the rest of an iris image. This proposed system generates an iris signature, which is based on the adaptive image thresholding. This method uses spatial processing, and local neighborhoods to generate the threshold. This method can potentially be used for partial iris recognition since it relaxes the requirement of using a majority of the iris to generate the signature. The preliminary research results have shown that the method is very effective. However, there are four iris images that cannot be enrolled in this system, and 46 iris images that cannot be identified.

Yingzi Du, T.B.Welch, Chein- I Chang [9] proposed a novel approach to iris recognition in this paper. It differs from traditional iris recognition systems it generates a one-dimensional iris signature that is translation, rotation, illumination and scale invariant. The Du Measurement was used as a matching mechanism, and this approach generates the most probable matches instead of only the best match. The merit of this method is that it allows users to enroll with or to identify poor quality iris images that would be rejected by other methods. This method could potentially improve iris identification efficiency. However, a weak point of iris recognition is that it needs the users' full cooperation. This system only needs to store a one-dimensional signal over a two-dimensional image. Also, in the match processing, no circular rotation is needed, so that matching could be much faster.

Mansi Jhamb, Vinod kumar Khera [10] explores iris recognition for personal identification and verification. In this approach a new iris recognition technique is proposed using Scale Invariant Feature Transform technique. Image-processing algorithms have been validated on noised real iris image database. The proposed innovative technique is computationally effective as well as secure in terms of recognition rates. Iris Extraction and recognition system has been developed steadily with the help of MATLAB and some mathematical calculations.

3. CONCLUSIONS

This literature overview discusses background information's of an iris, a detailed history of how iris has been started to be treated as a biometric trait and a general framework of iris recognition system which are currently being used. The main aim of this work is to provide a timeline view of various iris recognition techniques.

This overview of papers presents a survey on various techniques involved in iris recognition. The iris is a useful biometric for recognition systems largely from objective clinical and indirect development. The individual irises are highly distinctive and stable with age. The physiological characteristics are relatively unique to an individual. Iris recognition is automatic identification of an individual that has been research interest for recent few years. Through this paper we can study the relevant work done in this area. The different iris methods have its own advantages and disadvantages. From this survey it is seen that iris recognition for eye images which are acquired from a distance and under less constrained environments impose several problems, especially for the images acquired using visible imaging. Image quality becoming low is mostly undesirable in the visible illumination eye images acquired from such dynamic environments. Therefore the need is to develop iris recognition algorithm which helps to improve the security for credit card fraud over internet.

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