A REVIEW ON IRIS RECOGNITION SEGMENTATION TECHNIQUES

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Abstract - Iris recognition has grown into an inrecent years of popular science. The iris recognition is used in high-security areas because of its reliability and nearly perfect recognition rates. This paper is an Iris Recognition Survey with its. To improve the real-time performance of the algorithm, the image can be transformed into the frequency domain for the edge extraction. For iris recognition, the edge of the iris is a near-circle geometric structure that can be viewed as a series of condensed circles, creating a comparatively apparent gray-scale contrast to the surrounding image environment. The purpose of the technique is to recognize imperfect instances of objects within a certain class of shapes through a voting procedure.

Keywords–Image Processing,Iris Recognition,Hough Transform,

I.INTRODUCTION

Image processing is the technique of converting a picture into a digital form and of performing certain processes on it in order to acquire a superior image or to extract some essential data from it. It is basically a sort of signal exemption in which input is image, so a photograph or video frame and output can be image or image-related features. Usually Image Processing System consists of treating images as two-dimensional signals, while applying to them already common methods of signal processing.

Digital image processing has many recent applications in the areas of remote sensing, medicine, photography, production of films and videos, and security monitoring. New innovative technologies are emerging in the fields of image processing, especially in the domain of image segmentation. Semantic image segmentation, also called pixel-level classification, is the task of clustering together pieces of image belonging to the same class of objects.

II.Iris Recogntion

To get useful iris region, the iris image must be preprocessed. Preprocessing of images is divided into three steps: localization of the iris, normalization of the iris and improvement of the image. Localization of iris detects the inner and outer limits of iris. The detection and removal of eyelids and eyelashes that can cover the iris region. Iris normalization converts the iris image from Cartesian coordinates to Polar coordinates. The normalized image of the iris is a picture of a rectangle with angular resolution and radial resolution. The iris image has low contrast, and non-uniform illumination due to the light source position. The image enhancement algorithms can compensate for all of those factors.

Extraction of the feature uses method of texture analysis to extract characteristics from the normalized iris image. Template matching compares the user template with the templates from the database using a matching metric. The matching metric will provide a measure of similarity between two iris templates.

IRIS recognition is one of the most reliable methods for human identification in biometrics. Governments such as the Aadhaar initiative in India, have commonly used iris recognition techniques (Chen et al., 2016). Because of some inherent advantages, the iris has become one of the most reliable biometric traits for human authentication, e.g. it is a highly protected internal organ that is visible externally; iris patterns are highly distinctive with a high degree of freedom; iris patterns are relatively stable over time etc. State of the art algorithms for iris recognition have recorded promising performance (Hu et al., 2017). Most of these algorithms use binary (i.e., iris codes) functions. The binary nature of iris codes brings significant advantages in memory and computational cost, enabling iris recognition systems to be deployed on a large scale.

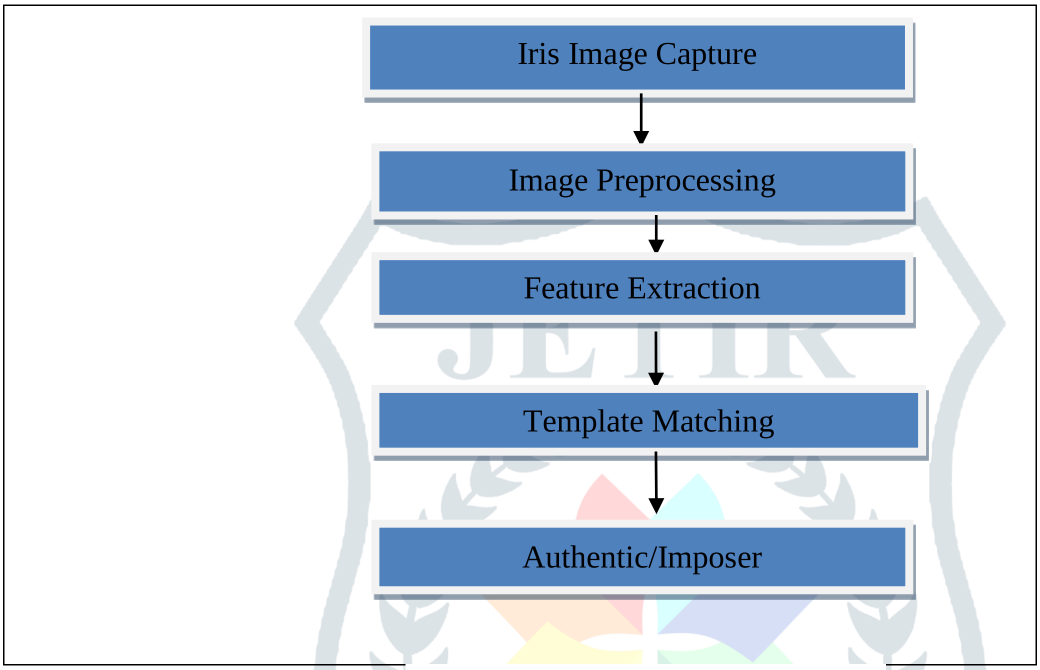

Figure 1:Phases of Iris Recognition

III.Hough Tramsform

Transform yourself Hough. Since it is possible to model the inner and outer boundaries of an iris as circles, circular Hough transform is used to locate the iris[3,4].First, edge detector is applied to a gray iris image to generate the edge map. The edge map is obtained by measuring the first strength value derivative and the results are threshold. To smooth the image, Gaussian filter is applied to select the correct scale of edge analysis.

IV.Literature Survey

Liu et al. (2017) proposes a code-level approach in heterogeneous iris recognition. The non-linear relationship between binary feature codes of heterogeneous iris images is modeled by an adapted Markov network. This model transforms the number of iris templates in the probe into a homogenous iris template corresponding to the gallery sample. In addition, a weight map on the reliability of binary codes in the iris template can be derived from the model. The learnt iris template and weight map are jointly used in building a robust iris matcher against the variations of imaging sensors, capturing distance and subject conditions. Extensive experimental results of matching crosssensor, high-resolution vs low-resolution and, clear vs blurred iris images demonstrate the code-level approach can achieve the highest accuracy in compared to the existing pixel-level, featurelevel and score-level solutions[5].

Hu *et al.* (2017) investigate the problem of iris code production from the point of review of optimization. Furthermore, the author investigate two additional objective terms, one exploits the spatial relationship of the bits in an iris code, and the other mitigates the influence of less reliable bits in iris codes. A scheme is also proposed to combine the two additional objective terms. The experimental results on benchmark datasets demonstrate that the proposed method leads to a generally improved performance in comparison to the traditional iris code, and the computational cost is acceptable in real applications. The experimental analysis also provides deeper insights into the proposed additional objective terms as well as the characteristics of iris codes. Future work may focus on: (1) designing more effective objective terms to produce iris codes; (2) examining the proposed method on more datasets covering more data variations, to investigate the stability and robustness of the proposed method to more varying data[2].

The iris is a stable biometric trait that has been widely used for human recognition in various applications. **Chen *et al.* (2016)** present a new approach for detecting and matching iris crypts for the human-in-the-loop iris biometric system. This detection method is able to capture iris crypts of various sizes. The scheme is designed to handle potential topological changes in the detection of the same crypt in different images. The approach outperforms the known visible-feature based iris recognition method on three different datasets. In addition, the benefit of the approach on multi-enrollment is experimentally demonstrated[1].

Zhang et al. (2018) develop a deep feature fusion network to improve the efficiency of mobile identification, leveraging the complementary information presented in iris and periodic regions. The proposed method applies first maxout units in convolutionary neural networks (CNNs) to produce a compact representation for each modality, and then fuses the discriminative characteristics of two modes. At the same time, the parameters of convolutionary filters and fusion weights are studied to optimize iris joint representation and periodic biometrics. In addition, the proposed model needs much less space for storage and computing resources than general CNNs[6].

Wang eta l.,(2019) People are paying increasing attention to identity security, especially in the case of some highly confidential or personal privacy, it is particularly important to identify individually. Recognition of the iris merely has the characteristics of high efficiency, not easy to counterfeit, etc., marketed as identification technology. This paper investigated daugman algorithms and iris edge detection [7].

Thompson et al.,(2018) Examines how iris recognition performance degrades upon violation of the first two assumptions. A data set that varies the presence of the cornea and a parameterized non-planarity of the iris shape across a wide range of eye gaze angles is created using a computer renderable eye model. Matching scores are generated using a trade matcher. When comparing the relative impact of each breach of assumption, it is noted that iris non-planarity poses a more significant problem than corneal refractive distortion with regard to the accuracy of iris recognition in non-frontal images [8].

V. Conclusion

Iris may be observed with varying imaging distance in different sizes. The radial size of the pupil may change accordingly due to illumination variations. The algorithms used in iris recognition are categorized into three phases: preprocessing of images, extraction of features and matching of templates. This paper sets out a review of well-known iris recognition research.

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