

A survey on biometric verification algorithms

¹S. Jothimani , ²S. Aanjanadevi , ³V. Palanisamy

¹Research Scholar, ²Ph.D Research Scholar, ³Professor,

Department of Computer Applications , Alagappa University, Karaikudi.

Email- ¹jothidiva24@gmail.com , ²adresearchscholar94@gmail.com, ³vpazhanisamy@yahoo.co.in

Abstract: Identification of authenticate user is mandatory before providing the services. Most of the World Wide Web services identifies the peoples with login authentication model. Biometric authentication methodologies are implemented to overcome the issues in login authentication. Biometric is the approach which is related to the physical and biological characteristics of people. The biometric based authentication mechanisms are implemented to offer efficient user authentication in existing services. The biometric models are classified into various schemes like face, finger print, hand, retina, iris, signature and voice. Iris authentication scheme is mostly considered as the best and accurate scheme than others. It is more reliable and helps in identifying peoples accurately. Iris recognition and authentication schemes have be made incredible escalation in the present services. The main theme of this paper is to analyze and compare the existing iris authentication schemes and their performance.

Key Words: : Authentication, Iris recognition, Bio metric incredible escalation.

1. INTRODUCTION:

In this web era, the online security breaches, frauds and information stealing increases day by day rapidly. It is mandatory to prevent the data become stealing. Most of the security breaches are caused by authentication failures or breaking the authentication mechanism. So the basic thing is to upgrade the user authentication mechanism as high secured and unbreakable. Iris authentication approach is the one of the biometric based approach. The iris based authentication is more reliable than using other biometric schemes. Iris authentication scheme is globally accepted because every individual has own unique iris pattern. The iris approach is proposed by Frank at first. Iris implementation scheme is divided into the following sequence:

- A. Iris Templates
- B. Iris Segmentation
- C. Feature Extraction
- D. Pattern Matching

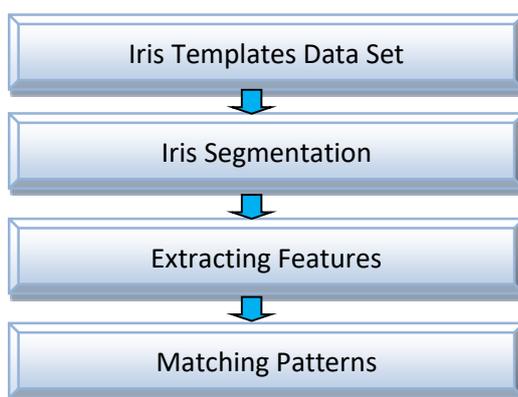


Fig 1: Iris Scheme Implementation Sequence

A. Iris Templates

The Initial stage is the iris templates administration stage. In this stage the actual iris patterns of every user is organized in data sets. When accessing the iris authenticated services, the iris template stage captures the Iris image of the user using gray scale camera. When the camera detects the stable iris, the camera captures the iris pattern images. The captured images are also managed by this stage. These images are used in future to authenticate the user.

B. Segmentation or Preprocessing

The Newly captured Iris image at the time of authentication may have noise data. The noise clearance and filtering tasks are handled in this stage. The noises are categorized as eyelids, eyelashes and masked regions. Before starting the authentication of user, these noises should be removed for better results. The noises may affect the comparison results due to the noise data. Here the noise data is detected and cleaned by using the detection algorithms. Canny edge detection algorithm and Gaussian filter is the mostly used algorithm to detect noise data.

C. Feature Extraction

Feature extraction stage determines the exact iris pattern which is needed to authenticate. The exact position of the Iris is detected and the detected iris portion is cropped in a small image. The result image only has the iris portion of the captured image. The authentication may slow or inefficient when the image size is larger. To improve the speed and high accurate authentication, the iris portion has to crop from the original image. The feature extraction stage detects the iris portion and crops the unnecessary portions.

D. Pattern Matching

The pattern matching is the final stage while authenticating users. The extracted iris pattern is compared with available iris templates. The actual iris pattern is matched with extracted iris pattern. This is done by the various matching algorithms. The matching algorithm generates the comparison report and the authenticated user can proceed further. The pattern matching unit should be designed to perform fast and powerful comparison of iris patterns.

2. LITERATURE REVIEW:

LiliPan et.al proposed a Paper entitled “The Algorithm of Iris Image Quality Evaluation”, mainly focuses the quality of an iris image. The focus of this paper is to determine eyelid problems and quality if the iris image. The paper and the proposed work is implemented with wavelet transformation model. The author implemented the proposed algorithm and it evaluates the quality of iris image with minimum computation time.

Amit Madhukar Wagh et.al Proposed a Paper entitled “Eyelids, Eyelashes Detection Algorithm and Hough Transform Method for Noise Removal in Iris Recognition”, concentrates in noise detection and removal. The paper has two major algorithms to detect and reduce noises. The eyelids and eyelashes noises are detected with detection algorithm and the iris image noises are reduces with Hough Transforms.

Yangquan lin ,et.al Proposed a Paper entitled “Iris Recognition Algorithm based on MMC-SPP”, proposed a fastest recognition approach with hybrid combination of two algorithms called Maximum Margin Criterion and Structure Preserving Projection. The approach reduces the dimensions in iris sub data and maintains global sub mode. The combined approach increases the effectiveness and learning ability of iris recognition models.

Richa chaturvedi et.al Proposed a Paper entitled “Iris Recognition using Daugman’s Algorithm and ANN”, [4] implemented a hybrid approach in recognition of iris pattern. The daugman’s algorithm is utilized to localization of iris pattern and the artificial neural network algorithm involves in matching with existing patterns. Both algorithms perform faster individually and the accuracy of the algorithms performance is 99.7%.

Yaser Daanial khan et.al Proposed a Paper entitled “Iris Recognition Using Image Moments and k-Means Algorithm”, [5] proposed an edge iris recognition scheme along with edge detection. The work initially segments the iris image using edge detection algorithm. The detected spots in iris image are transferred into a rectangular format. From the rectangular iris format, required image movements are extracted and analyzed. And finally the iris pattern is compared by clustering the movements with K means clustering algorithm.

Kazayuki miyazawa,Koichi et.al Proposed a Paper entitled “A Phase-Based Iris Recognition Algorithm, [6] introduced a phase based iris pattern recognition model. The authors first described the issues in recognition of iris pattern in low quality iris images. Further, the paper illustrates the phase based iris pattern recognition approach which can recognize the pattern in and provide best performance in low quality images also.

Paper titled “Iris Recognition Algorithms Based on Texture Analysis”, authored by Richard Yew Fatt Ng, Yong Haur Tay and Kai Ming Mok, [7] proposed an iris recognition model which is based on texture analysis. Here, the paper first splits the iris image into three zones. The zones are fixed and based on the texture pattern available in the iris image.

The three zones are weighted with a value based on its contribution. The weighted value is compared with the base iris. The results are produced as binary templates and the binary templates are fulfilling the recognition.

3. CONCLUSION:

This main theme of this paper is to analyze the previous schemes and models in iris image noise detection and recognition which are implemented recently. The existing papers are selected by based on popularity and implementation difficulty level. This paper fully focuses the models which can be easily implemented and effective. Necessary points are discussed in this paper clearly and the researcher can decide which model is suitable to their development in both noise detection and iris recognition.

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