

# IRIS Recognition using hybrid Technique, Methods of Moment and K Means Algorithm

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**Abstract:** Iris recognition is one of the biometric techniques for identifying a particular person. Iris also plays a significant role in recognition process. In this hybrid technique is used to import an iris image from the database and enhance the image using histogram equalization and 2dwt technique, method of moments is used to segment and extract the features of iris and then k means algorithm is used to cluster those segmented images and find the match between the resulting image and the image available in database using Euclidean distance formula.

**Keywords-***Iris Recognition, Biometric Recognition, Feature Extraction, Matching, database, method of moments, hybrid technique, segmentation, k means clustering algorithm.*

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## I. INTRODUCTION

Biometrics identification is identifying a person by his behavioural and biological characteristics, it has become popular need in this era because it focuses on security which is in demand throughout the world. There are many biometric identification applications like fingerprint, voice, retina, signature, palm, face, DNA and iris. Among all this iris recognition has showed better results for authentication of a person. Iris is an ideal part of human body, it is an internal organ that is well protected against damage and wear by a highly transparent and sensitive membrane each individual has a unique pattern for iris it differs even for identical twins and also left and right eye of the same individual. Blind people can also go under identification process as long as they have iris to be scanned. Various steps are implemented for iris recognition such as capturing of the iris and enhancing the features of the iris and the features are extracted and matching of the iris with database is done to get the required results. In the recent past researchers have developed many mechanisms through which iris recognition and matching can be done. In this paper iris recognition is done by method of moments, hybrid technique and k means algorithm.

## II. LITERATURE REVIEW

Khattab M. Ali Alheeti has described eye recognition via histogram equalization and wavelet techniques. the iris recognition approach is implemented via many steps, these steps are concentrated on image capturing, enhancement and identification. Different types of edge detection mechanisms; canny scheme, Prewitt scheme, Roberts's scheme and Sobel scheme are used to detect iris boundaries in the eyes digital image. The implemented system gives adequate results via different types of iris images [1].

BimiJain, Dr.M.K.Gupta, Prof.JyotiBharti the method of moments uses fast Fourier transform and it Transform converts image from spatial domain to frequency domain

and also filters noise in the image giving more precise information. Moments are area descriptors used to characterize the shape and size of the image. The moments values are invariant to scale and orientation of the object under study, also insensitive to rotation and scale transformation. At last Euclidean distance formula is used for image matching[2].

Chinni. Jayachandra, H.Venkateswara Reddy has described In eye authentication process, the pupil detection is most crucial step to recognize the eye. In eye, iris and sclera are used as the previous inputs using to recognize the eye with different mechanisms like segmentation combining with different versions. The inner edge in the eye is not a normal circle, which may create problem in accurate recognition. In segmentation process, if the image is having less texture then it leads to iris legacy. In this paper, we concentrate only on pupil to recognize the eye. To find the edges in the image we propose canny edge detection method, to reduce the noisy data in the image and detecting the edges. After detecting edges, those images are stored in CASIA database. Secondly, the K- means method is to identify the nearest pupil edge images from the database for the given input image. The results show that identifying pupil is better method to recognizing the eye and raising the recognition accuracy[3].

YaserDaaniaKhan, Sher Afzal Khan, Farooq Ahmad, and Saeed Islam describes the iris is first segmented from the acquired image of an eye using an edge detection algorithm. The disk-shaped area of the iris is transformed into a rectangular form. Described moments are extracted from the grayscale image which yields a feature vector containing scale, rotation, and translation invariant moments. Images are clustered using the k-means algorithm and centroids for each cluster are computed. An arbitrary image is assumed to belong to the cluster whose centroid is the nearest to the feature vector in terms of Euclidean distance computed. The described model exhibits an accuracy of 98.5% [4].

A.shruthikambli, B.AnkitaMalap, C.Punam Nalik, D.Pooja Tupe, and E.Dr (Mrs) Saylee Gharge has described iris recognition using two algorithms hybrid technique and method of moments in hybrid technique, the iris recognition algorithm is implemented using histogram equalization and wavelet techniques. The method of moments uses Fast Fourier Transform and moments. Here Phoenix database is used[5].

### III. PROPOSED WORK

The proposed work consists of hybrid method ,method of moment and k means clustering .At first an iris image is inputted and it is converted into grayscale image and

histogram equalization is done to enhance the image and 2D DWT is applied to generate significant features of the image and moments is applied to extract the characteristics of the iris appropriately and then k means algorithm is used to cluster the segmented features of the iris and Euclidean distance formula is used to find the nearest matching image from the database. This helps to find out the distance between the original image and the extracted image and find out the difference and match it efficiently and the distance between the original image and the given image.hence the final iris recognition is done using all these steps .This technique gives better performance when compared to other techniques.

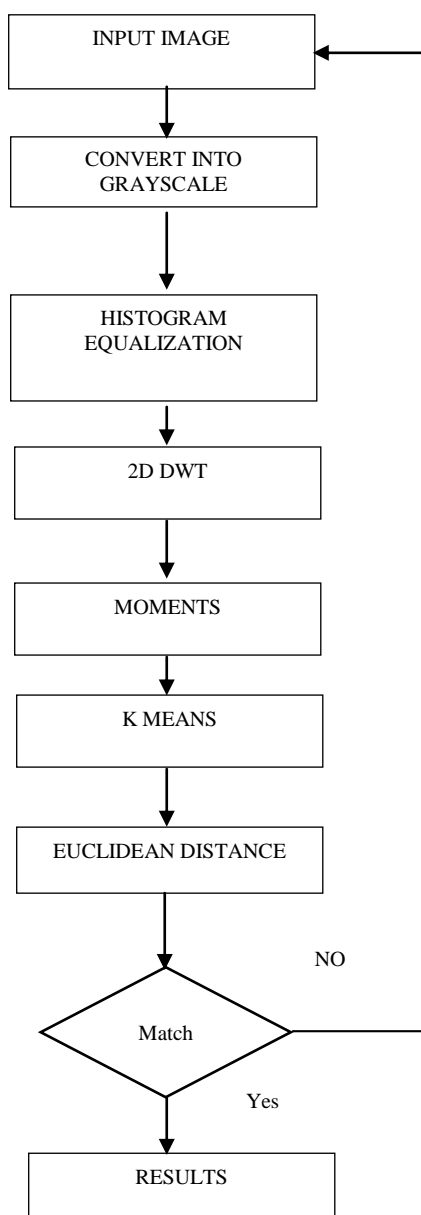


Fig.1 Process of recognition of Iris

#### IV. ALGORITHMS IMPLEMENTED

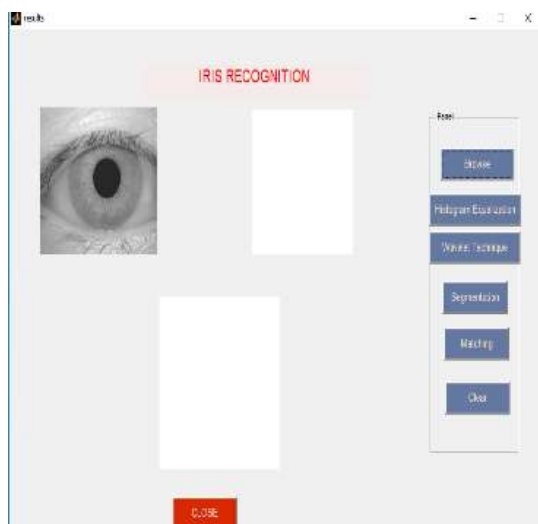
At first hybrid technique is applied the steps of it are

- Input the image
- Convert into grayscale
- Histogram equalization
- 2D DWT formula is used

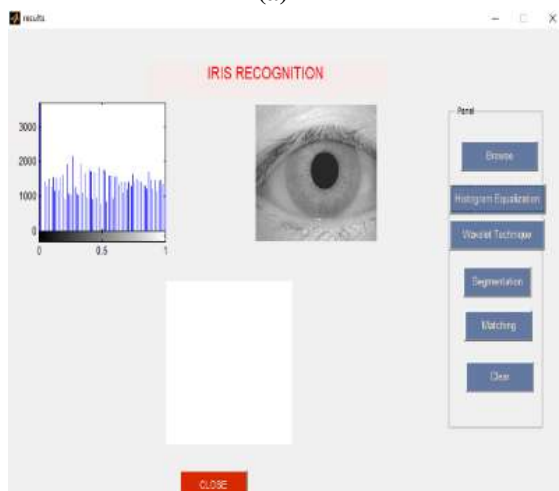
Next the method of moment of technique is applied by using the following steps

- Moments is applied
- And then clustered using k means clustering algorithm
- And Euclidean distance formula is used
- Lastly the results are matched and if it doesn't match we have to input the image again and follow the steps properly to get appropriate results.

#### V. EXPERIMENTAL RESULTS



(a)

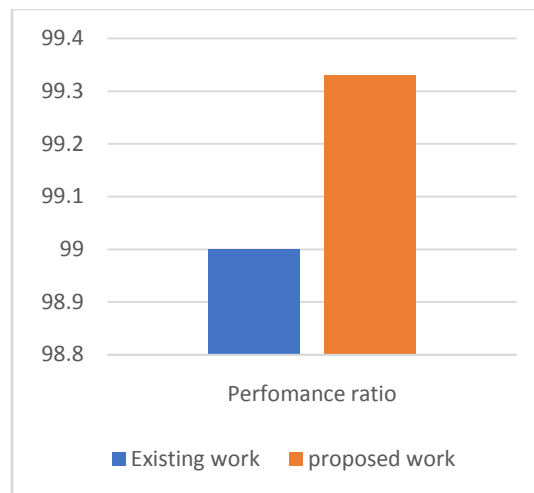


(b)

Fig. 2. Iris recognition hybrid and method of moments (a) image is imported (b) histogram equalization for image is done

#### VI. PERFORMANCE ANALYSIS

The proposed work implemented using hybrid and method of moments technique and using By the combination of two techniques better results are to be obtained, using this proposed technique we get accuracy of 99.33% and with a error rate of 0.30 %. When compared to other techniques this gives good recognition rate and accurate matching by the Euclidean distance.



#### VII. CONCLUSION

A biometric system is used to identify a person by unique features or the characteristics of a particular person. Iris recognition is one of most efficiently used biometric system, its being used over 30 years and still shows good results from other recognition techniques.

An efficient Biometric algorithm is proposed in this work using hybrid and method of moments, calculating all the moments at first the image is converted into grayscale and histogram equalization is done then segmentation is process is done and clustered using k means and Euclidean distance is used to find out the nearest matching image from the database, however it provides good results with better accuracy.

#### REFERENCES

- [1] Khattab M. Ali Alheeti, "Biometric Iris Recognition Based on Hybrid Technique Department of Information Systems", Anbar University College of Computer, Iraq International Journal on Soft Computing (IJSC) Vol.2, No.4, November 2011.
- [2] Bimi Jain, Dr.M.K.Gupta ,Prof.JyotiBharti, "Efficient iris recognition algorithm using method of moments" International Journal of Artificial Intelligence & Applications (IJAIA), Vol.3, No.5, September 2012.
- [3] Chinni. Jayachandra, H.Venkateswara Reddy, "Iris Recognition based on Pupil using canny edge detection

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- and KMeans Algorithm”, International Journal of Engineering and Computer Science ISSN: 2319-7242 Volume 2 Issue 1 Jan 2013 Page No. 221-225.
- [4] YaserDaania Khan, Sher Afzal Khan, Farooq Ahmad, and Saeed Islam4, “Iris Recognition Using Image Moments and k-Means Algorithm”, Hindawi Publishing Corporation Scientific World Journal Volume 2014, Article ID 723595, 9 pages <http://dx.doi.org/10.1155/2014/723595>.
- [5] A.ShrutiKambli, B. AnkitaMalap, C. PunamNaik, D. PoojaTupe, E. Dr. (Mrs.) SayleeGharge, “Authentication system using iris recognition”, International journal of advanced computer technology, volume 5, number 2, april 2016.