

IRIS AUTHENTICATION SYSTEM USING HYBRID TECHNIQUE –SURF

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ABSTRACT: Iris recognition system is one of the reliable and accurate biometric system. In IRIS recognition the Vital step around which the whole process revolves is localization of IRIS as well as pupil boundary. At present scenario there is need to develop an efficient technique for removal of noise in processing as well as novel feature extractor for accuracy point of view.

Keywords: localization, Robust features, Zernike, SURF, Normalization, Contour detection.

I. INTRODUCTION

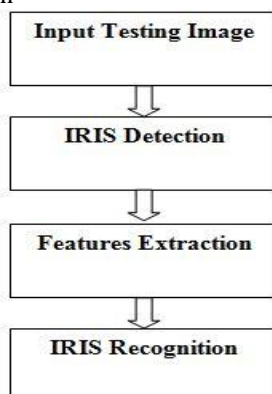
The term ‘BIOMETRICS’ is a Greek word that is a combination of ‘Bio’ which means life and ‘Metrics’ which means measurement. So Biometrics refers to measurement of human characteristics. Methods which identifies people based on physical or behavioral characteristic are of interest because these features are unchangeable and one cannot mislay its physical characteristics. Biometric method based upon the spatial pattern of the iris are believed to allow very high accuracy that’s why there is rise trends inclined towards the research in tract of iris recognition.

This paper introduce about proposed system that is how an iris is detected. what are the features which play an important role for its recognition and how it can be improved.

The following paper is systematized as follows i.e section 2 discuss about recognition technique and its features analysis. Section 3 deals with an introduction of proposed system. section 4 implementation. Section 5 about result discussions. Followed by future scope and conclusion.

II. SECTION 2

2.1 IRIS recognition



IRIS Recognition System

The Figure describes that firstly input the testing image for the iris detection then we detect the iris, where these iris are present. After that IRIS features are extracted from the detected IRIS. At last IRIS recognition is done by comparing

the extracted feature from the detected IRIS with IRIS database.

2.2 IRIS DETECTION TECHNIQUES

In image processing, IRIS detection is a computer technology that automatically determines the locations and size of human in digital images. It detects IRIS features and ignores anything else such as buildings trees and bodies. IRIS detection is a popular feature used in biometrics, digital cameras and social tagging.

2.3. Various steps involved in IRIS RECOGNITION.

To complete the process of IRIS recognition involves the following five steps.

- In this step an image is acquired either from database or directly taken using camera.
- From the acquired image, IRIS is detected.
- Local or global features are extracted from the IRIS detected.
- The extracted features are compared with the help of software being used for recognition.
- In this final step decision and its identity is provided. Otherwise that IRIS is decided as unknown.

Features extraction .

Features are the information in numerical form that generally difficult to understand By humans. So there is need of features descriptors where the data is represented in the form of matrix representation thresholds. Categorized into two levels that is global and local. Above features plays important role in iris detection and to be recognized with respect to contour and iris patch.

III. PROPOSED SYSTEM

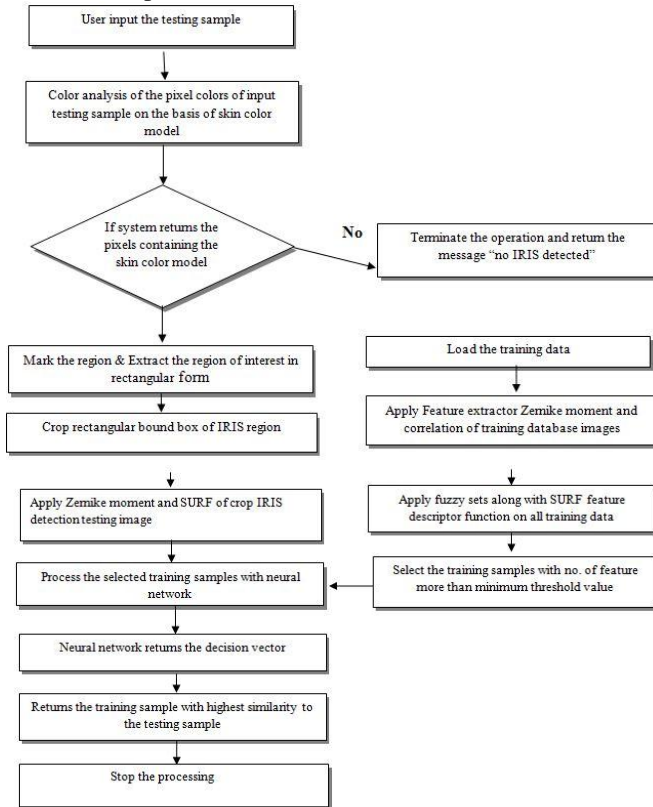
In this research, we propose an effective and efficient Iris detection and recognition technique by rising existing Iris recognition algorithms. This Iris recognition algorithm must be effective, accurate and efficient. We are offering a novel and robust feature extractor for Iris features along with Zernike moments and Neural Network based Iris detection for the purpose of authentication where the system will detect and recognize the persons using the Iris sample images. The new algorithm will adaptable to various Iris detection based authentication systems. This algorithm would be designed using combinations of robust feature descriptor, Zernike moments and neural network model for flexible and robust meta-heuristic Iris recognition model.

The main flaw in the existing model is the possibility of higher positive cases caused by the iris sample variations. So to overcome that problem we have hybrid a global feature which was earlier done using zernike moments with the new local feature extractor that is Surf.

IV. IMPLIMENTATION.

A strong and novel algorithm developed for IRIS detection and recognition using skin color model with IRIS Recognition using Artificial Neural Network. This proposed algorithm is useful for authentication and security for various fields such as banks and companies, Mobile devices.

Flow chart representation.



The Flow Chart diagram for the IRIS detection and recognition model.

V. SECTION 5

The statistical parameters to measure the statistical errors are measured in order to evaluate the overall performance of the proposed model by evaluating the samples by the means of the programming or the manual binary classification.

The parametric results obtained from the simulation

| PARAMETER | VALUE |
|--------------------------|---------|
| Sensitivity or Precision | 94.64% |
| Recall | 100.00% |
| Accuracy | 94.64% |
| F1-measure | 97.25% |

The value of precision has been recorded nearly at 94.64%, whereas the recall value has been found at 100%, which rules out the possibility of false negative cases. The value of precision (94.64%) lower than 100% indicates the existence of the false positive cases. The overall accuracy has been also recorded at 94.64%, and the F1-measure value of 97.25%. The overall accuracy value of nearly 95% is considered higher for the real-time implementations, whereas the F1-measure value at 97.25% indicates the very presence of lower statistical errors of false negative and false positive.

Table 5.4.1 Accuracy measured for two tested approaches (WIRE, HY SURF)

| METHOD | Iris cx | Iris cy | Iris rad | Pupil cx | Pupil cy | Pupil rad | overlap |
|--------|---------|---------|----------|----------|----------|-----------|---------|
| WIRE | 3.05 | 2.76 | 1.91 | 1.87 | 2.17 | 0.93 | 0.87 |
| HYSURF | 0.1771 | 0.0885 | 1.1187 | 1.0333 | 1.0163 | 1.0561 | 0.94 |

Above table shows that hybrid SURF technique provides best results with outliers in majority of cases. That is Proposed technique shows a higher robustness in terms of center and radii of iris and pupil. Also proposed system outperforms in terms of overlap.

VI. CONCLUSION

In this work a neural network approach for IRIS detection and recognition system using SURF is proposed. In which basic detection of IRIS is done followed by feature extraction with the help of Zernike and surf t.e local as well as global feature extracted for higher accuracy. In the future, the proposed model can be further enhanced by using the amalgamation of the texture, size and color features with deep learning for the higher flexibility and robustness. The proposed model can be further improved for the processing of live video sample based IRIS region localization for the purpose of authentication or people search on the video data. Also, the IRIS based authentication model can be combined with the face feature detection in order to create the complex authentication system for the variety of high security applications.

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