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IRIS RECOGNITION

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ABSTRACT

Among existing biometrics, iris recognition systems are among the most accurate personal biometric identification systems. However, the acquisition of a workable iris image requires strict cooperation of the user; otherwise, the image will be rejected by a verification module because of its poor quality, inducing a high false reject rate (FRR). The FRR may also increase when iris localization fails or when the pupil is too dilated. To improve the existing methods, we propose to use video sequences acquired in real time by a camera. In order to keep the same computational load to identify the iris, we propose a new method to estimate the iris characteristics. First, we propose a new iris texture characterization based on Fourier-Mellin transform, which is less sensitive to pupil dilatations than previous methods. Then, we develop a new iris localization algorithm that is robust to variations of quality (partial occlusions due to eyelids and eyelashes, light reflects, etc.), and finally, we introduce a fast and new criterion of suitable image selection from an iris video sequence for an accurate recognition. The accuracy of each step of the algorithm in the whole proposed recognition process is tested and evaluated using our own iris video database and several public image databases, such as CASIA, UBIRIS, and BATH.

Kkeywords: Pattern Recognition, Iris Recognition, Iris Matching, Fourier Millen Transform

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INTRODUCTION

Face recognition and iris recognition has become one of the most challenging tasks in the pattern recognition field. This interest is motivated by wide applications ranging from static matching of controlled format photographs such as passports, credit cards, ration card, identity of electors, driving licenses, and mug shots to real time matching of surveillance video images, robot vision and machine intelligence. Nowadays, intelligent extraction of information is becoming exceptionally important because image and video databases are widespread and expensive. It is also commonly accepted thatt human faces are one of the most common and very specific objects, attempted to be solved in video sequences and color images. A system capable of performing automatic detection and recognition of human iris rrepresents an example of such an intelligent information retrieval. The recognition of faces and iris is very important for many applications such as video surveillance, retrieval of an identity from a database for criminal investigation, biometric systems, etc., applicationn.

The requirement for reliable personal identification in computerized access control has resulted in an increased interest in Biometric (physiological or behavioural characteristics which uniquely identify people). Biometric being investigated includes fingertips, speech, and signature dynamics and face recognition. Sales of identity verification products exceed $100 Million. Face recognition has the benefit of being a passive, non-intrusive system for verifying personal identity. The techniques used in the best face recognition system may depend on the application of the system. There are at least two broad categories of the face recognition systems may depend on the application of the system.

RELATED WORK

Did you ever lost the key of your door lock or forget where you keep your car keys? Or you might forget the hectic passwords you set to log on your computer, smartphone or any websites. If none of these happened to you, you either are a super human or live in a village far from human civilization and the recognition .We all have face this situation and practice some bad words when we couldn't enter our house or sign in our own gadgets. What if we don't need to carry the keys or remember any lengthy passwords? Maybe a solution that will allow us to forget about the keys or passwords. The solution is available now, it is biometric technology. A reliable automatic recognizing system has long been a cherished dream to the scientists. With the advent of biometric technology, the automatic recognizing system is now quite common through variant modalities such as fingerprint, iris, face, palm vein recognition etc. Among all the biometric modalities, many recognize iris recognition as the best biometric modality as it provides the highest accuracy. It is a biometric identification method that works with

mathematical pattern-recognition techniques on video images. The complex metrics of this identification system are unique, fast and stable compare to other modalities.

Iris recognition is an automated method of biometric identification that uses mathematical pattern-recognition techniques on video images of one or both of the irises of an individual's eyes, whose complex patterns are unique, stable, and can be seen from some distance.

John Daugman is the inventor of this system. He developed and patented the first useful algorithms to perform this biometric recognition system. To describe how iris recognition works in a developer's view is quite complex. Here we will give you a brief idea about how does iris recognition work. Iris recognition works in two stages i.e., Enrolment and Verification, at first, it completes the enrolment process of an individual and creates a profile, and then it verifies that person by matching the data with its database.

ELEMENTS OF IMAGE ANALYSIS

The word image is defined as an object or analogous of a being or a thing. An image can therefore be thought of as anything, which represents something else. An image (monochrome image or single color image such as photograph black and white photograph) may be defined as a two dimensional function f(x, y), where x and y are spatial(plane) coordinates and an amplitude offer at any pair of coordinates (x, y) is called the intensity or grey level of the image at that point. Similarly, it is possible to represent a three-color image such as the classic photograph by three functions f R (x, y), f G (x, y) and f B (x, y)expressing the intensity of each of the three primary component colors red, green and blue at point (x, y) on the image. There are two types of image processing.

Analog Image Processing: Any form of processing which converts continuous image in to another continuous image is called analog images processing. This includes calculation carried out on analog computers as well as optical processing techniques.

Digital Image Processing: Image processing technology, carried out by a digital computer, converts a discrete image into a discrete output image by sampling and quantization techniques. Therefore digital image is an image of f(x, y) that has been digitized in both spatial coordinates and brightness. It can be considered as a matrix of numbers whose row, column indices identifiers a point in the image, and the corresponding.

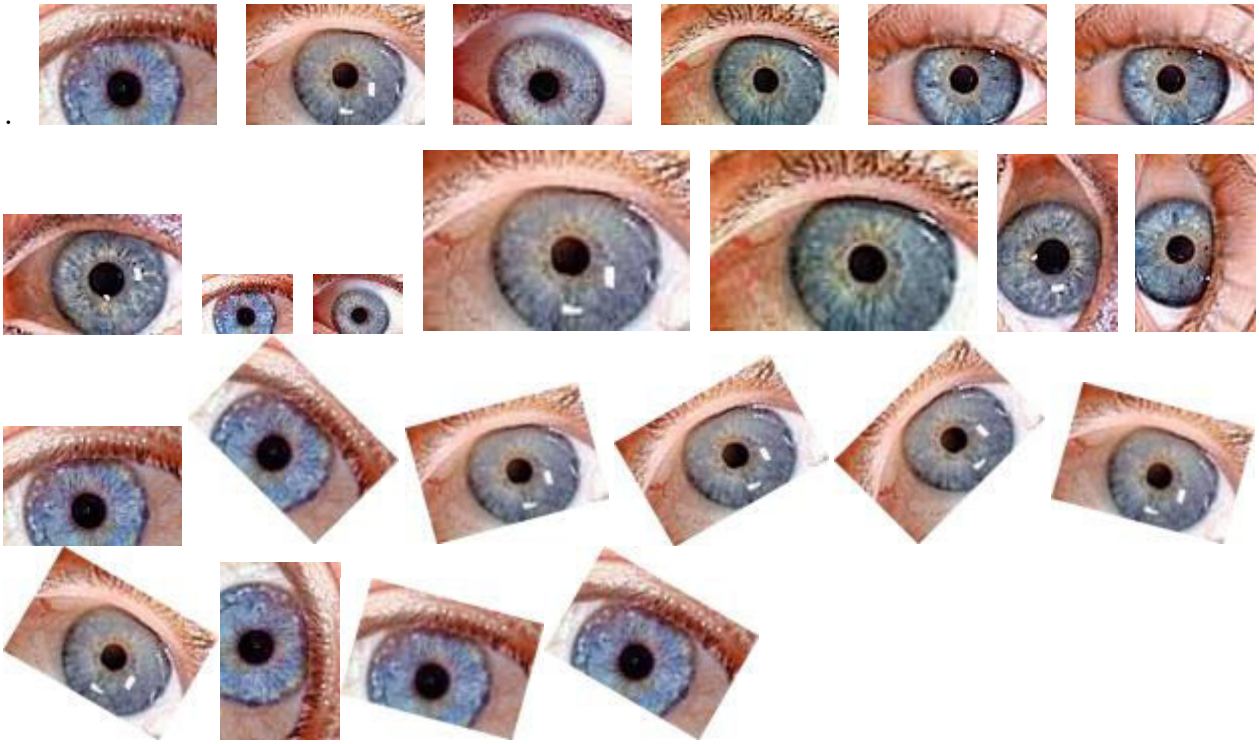
RESULT

For recognition of Iris images with respect to an ideal iris image stored in a data base, we have performed by computing the Euclidian distance between the FMT invariant of an unknown iris image and the FMT invariant of the image available in data base. If the Euclidian distance between test image and database image is minimum then it is considered as these two images are same. If the Euclidian distance between test Image1 and database Image1 is zero, therefore database is same as test image1. By

the result analysis, the minimum Euclidian distance is obtained between Image1 and Image15.This indicates that the Image19 and Image15 after comparing with the test image1 are not equal. Also by comparing the other images with the test image1, we have analysed that the results are not equal. The maximum allowable error for similar Images is less than or equal to 0.5.

Limitations:

- ✓ When the test image is rotated beyond 60 degrees, then the error in Euclidian distance is more than 0.5.
- ✓ The maximum range of scaling that can be acceptable using FMT is 0-2. If the Scaling factor is more than 2 then the error in Euclidian distance is greater than 0.5. Since scaling is done on the discrete time signal
- ✓ .



Applications:

Face recognition and iris recognition has become one of the most challenging tasks in the pattern recognition field. This interest is motivated by wide applications ranging from static matching of controlled format photographs such as passports, credit cards, ration card, identity of electors, driving licenses, and mug shots to real time matching of surveillance video images, robot vision and machine intelligence. Now a day, intelligent extraction of information is becoming exceptionally important because image and video databases are widespread and expensive. It is also commonly accepted that human faces are one of the most common and very specific objects, attempted to be solved in video sequences and color images.

CONCLUSION

The position, rotation and scale invariant descriptors yield a satisfactory discriminating and clustering performance for multi-class pattern recognition. Images with Gaussian noise having a standard deviation equal to half the object intensity and some deformed images were also correctly recognized. For the objects considered the use of only three invariant features were sufficient to accomplish invariant recognition. Hence identification based on Iris pattern is one of the most reliable and stable way among all available methods. Our Iris recognition system consists of four processes i.e., Image Acquisition, Pre-processing, Feature extraction and Matching. In this paper work, we successfully proposed 'Iris Recognition System' using 'Fourier Mellin Transform (FMT)' Invariant. The proposed approach is translation, rotation and scale

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