IRIS ATTENDANCE SYSTEM

PROJECT REPORT

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INTRODUCTION

Security is becoming increasingly important in the information based society. Personal authentication is one of the most important ways to enhance the security. However, the traditional personal authentication methods, including token-based ones(such as keys and cards, etc.), suffer from some instinctive defects: the token can be stolen or lost and the knowledge can be cracked or forgotten.

Out of various biometric techniques such as face recognition, fingerprint recognition, gait, hand and finger geometry, ear, iris recognition have been accepted as best and most accurate biometric techniques because of the stability, uniqueness, and non-invasiveness of the iris pattern. The iris region (shown in figure 2), the part between the pupil and the white sclera provides many minute visible characteristics such as freckles, coronas, stripes, furrows, crypts which are unique for each individual. Even two eyes of same person have different characteristics. Furthermore, the chance of obtaining two people with same characteristics is almost zero that makes the system efficient and reliable when security is concerned

Typically, the iris recognition system consists of four modules viz. Image acquisition, segmentation, feature extraction and matching as shown in fig. 4. After acquiring eye images, iris part is localized by demarcating its inner and outer boundaries and then the circular iris are transformed to the rectangular with fixed size. This is done in segmentation and normalization module. Next is the feature extraction module where the unique iris feature is extracted using appropriate

technique from the segmented iris. Finally, the extracted features are matched with the stored pattern to validate the identification process

Iris Recognition System

Iris recognition is an automated method of biometric identification that uses unique iris pattern of an individual.Iris is an internal organ of our body visible from outside whose patterns are complex random patterns which are most unique and stable.Among all the biometric technologies used for human authentication today, it is generally conceded that iris recognition is the most accurate .Out of various biometric techniques such as face recognition, fingerprint recognition, gait, hand and finger geometry, ear, iris recognition have been accepted as best and most accurate biometric techniques because of the stability, uniqueness, and noninvasiveness of the iris pattern. The iris region, the part between the pupil and the white sclera provides many minute visible characteristics such as freckles, coronas, stripes, furrows, crypts which are unique for each individual. Even two eyes of same person have different characteristics. Furthermore, the chance of obtaining two people with same characteristics is almost zero that makes the system efficient and reliable when security is concerned Coupling this high confidence authentication with factors like outlier group size, speed, usage/human factors, platform versatility and flexibility for use in identification or verification modes- as well as addressing issues like database size/management and privacy concerns- iris recognition has shown itself to be exceedingly versatile and suited for large population applications.

Advantage

- Very high accuracy.
- Verification time is generally less than 5 seconds.
- The eye from a dead person would deteriorate too fast to be useful, so no extra precautions have to been taken with retinal scans to be sure the user is a living human being.

- As iris is an externally visible internal organ of our body, it cannot be easily abused.

Disadvantage

- Intrusive. Require user cooperation during image acquisition.
- A lot of memory for the data to be stored.
- Very expensive.
- High quality eye image is needed for the system

Performance measures of a Biometric System

Performance of biometric systems is normally measured in terms of the following error rates:

1. False Accept Rate (FAR):
   "The probability that a biometric system will incorrectly identity an individual, or will fail to reject an impostor For verification systems, this can be calculated as number of falsely accepted people number of all impostor attempts.

2. False Match Rate (FMR):
   "The rate for incorrect positive matches by the matching algorithm for single template comparision attempts"
3. False Reject Rate (FRR):
   "The probability that a biometric system will fail to identity a genuine enrollee For verification systems, this can be calculated as number of falsely rejected people number of all genuine attempts.
4. False Non Match Rate (FNMR):
   "The rate for incorrect negative matches by the matching algorithm for single template comparison attempts"If the biometric system uses only one comparison attempt for making a decision, FNMR is equal to FRR.

Objectives

The main objectives of present project work is to i. Study various iris recognition system proposed by different authors. ii. Propose and implement iris recognition system to overcome the difficulties of existing system. iii. Analyze the results obtained by the proposed iris recognition system and compare the results with existing system.

Stages of Iris Recognition System

Iris recognition is a stepwise procedure as shown in The first step is the image capture. Then images are brought to appropriate forms in order to perform some preprocessing steps. Then the iris is localized and segmented for further processing. The texture of the iris is extracted then using appropriate techniques. Finally texture matching is done to validate identification process. The major steps can be summarized as:

a) Image Acquisition: Image is captured under proper illumination, distance and other factors affecting image quality are taken into consideration. This step is crucial because image quality plays an important role in iris Localization.

b) Image Segmentation: In this step, the iris region is isolated from the given image. The iris segmentation is a vital step for overall performance of the system.

c) Feature extraction: In the feature extraction stage, unique feature from the segmented iris is extracted to create an iris template. This template further used for recognition.

Application of Iris Recognition System:

One of the most promising applications for iris recognition is that it increases security for the transportation industry. The current requirements for security airports could increase the use of biometric devices in this area. Another promising application of iris recognition system is for bank ATMs. Someday ATM users will be identified by their irises rather than their PIN numbers. A person‟s Iris code can be stored either in a database or on a smart card. The ability to store the Iris Code on a card or token is important because it eliminates privacy concerns associated with retaining identities in a

centralized database. A biometric technology such as Iris recognition can easily eliminate or complement the standard log-in password for individual authentication to a computer.

CONCLUSION AND FUTURE WORK

In this project work, an approach for Iris recognition system has been proposed. Simple morphological operations and two dimensional median filtering techniques are used to detect the pupil. The noises such as eyelashes, reflections are removed through the linear thresholding. The 1D log Gabor wavelet transformation is applied for feature extraction from segmented iris image. The Humming Distance is adopted as the metric of dissimilarity between input iris template and enrolled iris templates. From the experimental results, it is observed that the proposed approach is more efficient compare to existing methods viz. Masek‟s method for the considered dataset. It is also observed that proposed approach takes reasonable amount of time to perform iris segmentation and recognition accuracy is also reasonable. The future work would be to test the influence on accuracy of the proposed approach over a large dataset and also to develop more robust iris recognition system suitable for real life applications