A REVIEW FOR STUDENT ATTENDANCE SYSTEM USING IRIS AUTHENTICATION

[1]PRAJAKTA LAD, [2]SONALI MORE,
[3]SIMRAN PARKHE,[4]PRIYANKA NIKAM, [5]DEEPALI CHAUDHARI

[1,2,3,4] Student, Department of computer Engineering, DYPCOE, Maharashtra,India
[5] Assistant professor, Department of computer Engineering, DYPCOE, Maharashtra,India

ABSTRACT

A biometric system provides automatic identification of an individual based on a unique feature or characteristic possessed by the individual. Iris recognition is regarded as the most reliable and accurate biometric identification system available. Most commercial iris recognition systems use patented algorithms developed by Daugman, and these algorithms are able to produce perfect recognition rates. However, published results have usually been produced under favourable conditions, and there have been no independent trials of the technology. The iris recognition system consists of an automatic segmentation system that is based on the Hough transform, and is able to localise the circular iris and pupil region, occluding eyelids and eyelashes, and reflections. The extracted iris region was then normalised into a rectangular block with constant dimensions to account for imaging inconsistencies. Finally, the phase data from 1D Log-Gabor filters was extracted and quantized to four levels to encode the unique pattern of the iris into a bit-wise biometric template.

Keyword: - *Iris biometrics, Active Camera, User biometrics, Radius Calculation, Authentication, Pattern recognition, Segmentation*

1. Introduction

In the entire globe any educational organization is concerned in relation to the attendance of individuals because this has an effect on their overall performances. In conventional method attendance of students are taken by calling student names or signing on paper which is extremely time overwhelming. To eliminate this problem one of the solutions is a biometric-based attendance system that can automatically capture student's attendance by recognizing their iris.The objective will be to implement an open-source iris recognition system in order to verify the claimed performance of the technology. The development tool used will be JAVA , and emphasis will be only on the software for performing recognition, and hardware as Active camera for capturing an eye image. A rapid application development (RAD) approach will be employed in order to produce results quickly.

The future system will be developed using Face detection Algorithm using SSR filter mechanism and Skin Pixel detection using RGB model.

2. Literature Survey

Mojtaba Najafi and Sedigheh Ghofrani [1] proposed a system to implement iris recognition algorithm. The new feature extraction methods according to ridgelet transform and curvelet transform for identifying the iris images are provided. At first, after segmentation and normalization the collarets area of iris images has been extracted. Then the quality of image by using median filter, histogram equalization, and the two-dimensional (2D) Wiener filter is improved. Finally the ridge let transform and curvet transform are applied for extracting features and then the binary bit stream vectors are generated.

Samir Shah and Arun Ross[4]described a novel iris segmentation scheme employing geodesic active contours (GACs) to extract the iris from the surrounding structures. The proposed scheme elicits the iris texture in an iterative fashion. The matching performance of the implemented segmentation algorithm was evaluated on the WVU non-

ideal and CASIA -Interval iris image database. In the case of the WVU database, we speculate that the image acquisition protocol has a role to play. If the left iris is captured first, the subject may get used to the acquisition process and thus be able to present the right eye in a fashion that results in better image quality (or vice-versa).

3. Human Iris

The **iris** is a thin, circular structure in the eye. It controls the diameter and size of the pupils. Eye color is the color of the iris. In humans, the iris may look green, blue, brown, hazel (a combination of light brown, green and gold), grey, violet, or even pink. In response to the amount of light entering the eye, muscles attached to the iris expand or contract the pupil. The larger the pupil, the more light can enter the eye and reach the retina.

.

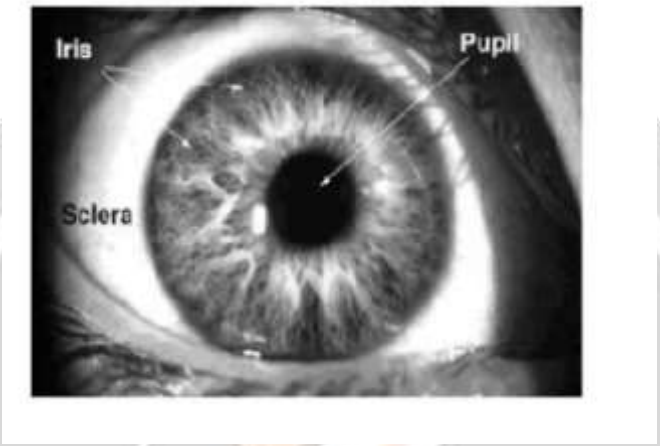


Fig -1 Human Eye structure

4. Attendance Techniques

4.1 Computerized Attendance System

In 2008, Nucleus Research proposed the use of a computerized attendance system, which can eliminate human involvement, human data entry mistake, repetitive work. This system is going to increase productivity, reduced payroll error, and reduced payroll inflation, reduced overtime, retirement of legacy systems, Elimination of paper costs, and which can provide all the reports on demand. In this system, faculty has to take attendance manually, only these records have to be entered into the computerized system. But in this also, the problem of data entry mistake may occur [5].

A desktop application developed by Jain et al. [6], in which all the list of registered students in a particular course will be displayed when the lecturer start the application. The attendance registration is done by clicking a check box next to the name of the students that are present, and then a register button is clicked to mark their presence. But in this also, human involvement for attendance tracking is needed.

Another similar project was proposed, but in this case the student will have to register individually using a client server socket program from their device (laptop) [7].

4.2 Bluetooth Based Attendance System

In 2013, Vishal Bhalla et al. [9], have proposed the attendance system which can take attendance using Bluetooth. In this project, attendance is being taken using instructor's mobile phone. Application software is installed in instructor's mobile telephone enables it to query student's mobile telephone via Bluetooth connection and through transfer of student's mobile telephone Media Access Control (MAC) addresses to the instructor's mobile telephone, presence of the student can be confirmed. The problem of this proposed system is student's phone is required for

attendance. In case of students' absent if his mobile is given to his friend then also present is marked. So presence of student is not necessary only phone should be in coverage area.

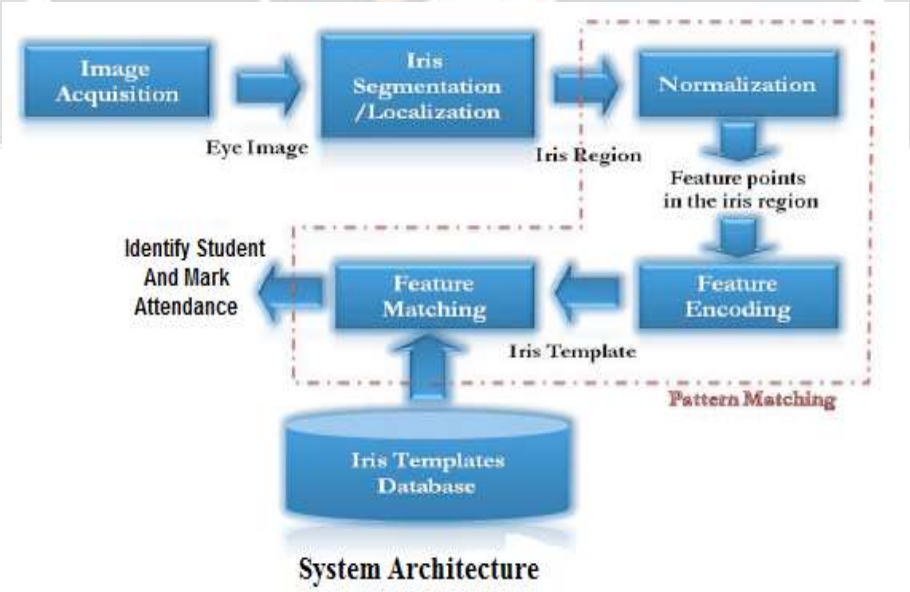
4.3 NFC based Attendance System

The NFC-based applications simplify various human day-to-day activities by simply touching an object fixed or integrated with NFC tag. For instance, Smart Touch is one of the early NFC projects that focuses on NFC technology which was coordinated by VTT Technical Research Centre Finland; applications in various areas were developed under this project such as mobile payment and ticketing, glucose meter, etc. [8]. In [11], author presents the implementation of an (AMS) Attendance Management System that is based on Bluetooth and NFC technologies in a multiuser environment. It uses fingerprint & the Bluetooth address of the NFC enabled phone of the user to authenticate the identity of the user. A Java based desktop application receives the NFC tag IDs, other information associated with the mobile phone and the user and submits them to an analyser for the interpretation of the user's behaviour. But in this case, student must be having NFC enabled phone to mark presence in the class room.

4.4 Face Recognition based Attendance System

In [8], Student attendance is being taken using one of the biometric technique. i.e. Face Recognition. Since Iris and Fingerprints are very short-distance biometrics but our application requires a person to be at a medium distance from the camera, which is fixed at the centre of the classroom near the black board, so that the view of the camera covers the entire classroom. The model is developed with the help of real time OpenCV library. The proposed system comprised of using the Viola Jones algorithm for detecting the human faces and then the detected face is resized to the required size, this resized face is further processed by using linear stretch contrast enhancement and finally it is recognized using a simple PCA / LDA. Once recognition is done, automatically attendance will be updated in an Excel Sheet.

5.Iris attendance framework



System Architecture

6. Techniques used and Algorithms

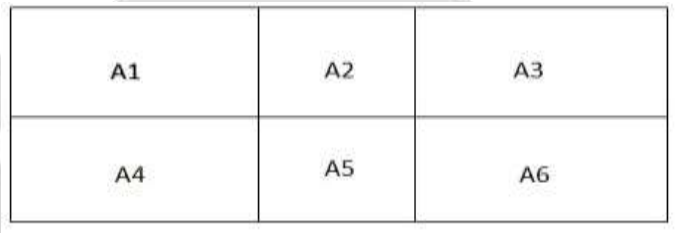
6.1 JMF

The Java Media Framework (JMF) is a Java library that enables audio, video and other time-based media to be added to Java applications and applets. This optional package, which can capture, play, stream, and transcode

multiple media formats, extends the Java Platform, Standard Edition (Java SE) and allows development of cross-platform multimedia applications. Currently used API for Java, the Java Media Framework (JMF) is dealing with real-time multimedia presentation and effects processing. JMF handles time-based media, media which changes with respect to time. Examples of this are video from a television source, audio from a raw-audio format file and animations. For our project we will be using JMF version 2.1 and above.

6.2 SSR

The extraction of face candidates is done using the six segment rectangular filter or the SSR filter. The rectangular region is divided into six segments A1-A6. Initially, a rectangle is scanned throughout the input image. Real time tracking of eyes, many a times, relies on the location of the region between-the-eyes (BTE). By placing the SSR filter, the eyes and between-the-eyes region is found out by calculating the average pixel value within the segment.



We denote the average pixel value within a segment Ai as Ai'. Then when on eye and eye brow are within A1 and the other within A3, we can expect

A1'<A2' and A1'<A4' …(1)

A3'<A2' and A3'<A6' …(2)

A point where (1) and (2) can be satisfied can be considered to be face candidate. Once the face candidates are identified, the remaining area of the face that will not be used is discarded.

7. CONCLUSIONS

The design of student attendance system is based on Biometric system. It is a distributed application in which the attendance is taken on client machine and it will be send to department machine(Server). The student has to stand in front of camera and camera will scan the Iris of student. The scanned iris will be matched with data of student stored in database and accordingly, attendance will be marked. This will reduce the pen and paper workload of faculty members of institute. This will also reduce the chances of proxies in the class. Also it will help to keep the student records safe.

8. REFERENCES

[1]. Mojtaba Naja and Sedigheh Ghofrani, "Iris Recognition Based on Using Ridgelet and Curvelet Transform," International Journal of Signal Processing, June, 2011.

[2]. C.M.Patil,Sudarshan Patil kulkarani, "Iris Feature Extraction for Personal Identication using LiftingWavelet Transform ," Proc. 10 International Journal of Computer Applications (0975 - 8887) Volume 1 No. 14 .

[3]. Woo Suk Yang l, "Implementation of an Identication System Using Iris Recognition ," International Journal of Security and Its Applications Vol. 7, No. 4, July, 2013.

[4]. Samir Shah, Arun Ross, "Iris Segmentation Using Geodesic Active Contours ," IEEE transaction on information forensic and security, VOL. 40, NO. 4, December 2009

[5]. John Daugman, "New Methods in Iris Recognition ", IEEE transaction on system, man, and cybernetics|PART B: cybernetics,vol. 37, No. 5, October 2007.

[6]. Ming Yang,James Crenshaw, Bruce Augustine1 Russell Mareachen, Ying Wu, "Face detection for automatic exposure control in handheld camera ", 16th Panhellenic Conf. on Informatics.

[7]. Arun Ross, Raghunandan Pasula, Lawrence Hornak , "Exploring Multispectral Iris Recognition beyond 900nm ," Proc. of 3rd IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS), (Washington DC, USA), September 2009

[8]. Richard P. Wildes, "Iris Recognition: An Emerging Biometric Technology", proceeding of IEEE. vol. 85. No. 9. September1997

[9]. Dr. S. Ramnarayan REDDY, Deepanshu GOYAL and Ankit BANSAL, "Mobile Based Attendance Management System". Miss. Namrata N. Shahade, Miss. Priya A. Kawade and Mr. Satish L. Thombare, "Student Attendance Tracker System in Android"

[10]. Samuel King Opoku, "An Automated Biometric Attendance Management System with Dual Authentication Mechanism Based on Bluetooth and NFC Technologies", International Journal of Computer Science and Mobile Computing, IJCSMC, Vol. 2, Issue. 3, March 2013, pg.18 – 2, ISSN 2320–088X

[11]. Media Anugerah Ayu, "TouchIn: An NFC Supported Attendance System in a University Environment", International Journal of Information and Education Technology, Vol. 4, No. 5, October 2014, DOI: 10.7763/IJIET.2014.V4.448 .