

A Survey on Effective Attendance Marking Using Face Recognition Behavior Monitoring and RFID

M. Suganthi, P. Sushmita, V. Tamil Selvi ,M.P.Karthikeyan

Department of Computer Science and Engineering , S.A. Engineering College
iamtamilbe@gmail.com

Abstract : *In the existing system, Attendance monitoring is an Old Technology to call the names of the Students Manually. Proxy Attendance is quite comfortably happening in it. In the proposed system, RFID system is used to monitor the student attendance but has some drawbacks. In the examination hall every student is provided with System and RFID Reader. RFID tag is verified then Camera is initiated and Face Recognition is processed using Mat lab. Attendance system is made automatic. After verification, random set of questions are generated to the user. Time limit for answering every question is monitored and buzzer is initiated to the invigilator in case of any malpractice like, Detection of Sound, movement of Student. Finally data is stored in cloud and the result is displayed on screen.*

Key Words: Face Recognition, RFIDreader, RFID tag, Attendance system, Detection of sound, Cloud.

I.INTRODUCTION

Biometrics is automated methods of recognizing a person based on a physiological or behavioural characteristic. Among the features measured are; face, fingerprint, hand geometry, iris, retinal, signature, and voice. The EC authority considers that biometric systems store the reading on media as encrypted templates. In addition to these works, novel authentication architecture which relies on RFID tag followed by two face recognition steps is introduced.

The initial stage uses the Two-Dimensional Principal Component Analysis and the second stage is based on the Speeded-up Robust Features Detector pattern matching algorithm. The process includes three steps. First, the parameters along with a very high recognition rate and low false acceptance rate are calculated for two stages. Second, the proposed approach avoids the storage of information of all the authorized people. This omits the usage of centralized database. It only relies on the RFID tag with personal biometric information stored in it.

Third, RFaceID is created to work on low resolution images along with very less storage capacity which has very good accuracy over existing state even in presence of largely varying illumination. In this paper, a gist of related works and how it addresses their limitations are listed. It proposes a relation between face recognition and face authentication, which is introduced in Section IV. Sections V and VI describe the enrolment and the authentication phases, respectively.

Section VII presents a testing protocol which is mainly created to assess the performance of the authentication algorithms and result comparison is done by a recent state-of-the-art algorithm based on Gabor Disparity. Section VIII demonstrates the superiority of RFaceID, which shares some structural similarities with RFaceID and was recently presented in. Finally, concludes the paper and gives hints for future work.

II.RELATED WORKS

M.Vadiraj et.al. [i]described that in each and every organization attendance monitoring is made as one of the most important task. Many traditional methods have been proposed for the same. This paper provides an efficient method for marking attendance which is based on facial recognition of an individual. In this method the images of the students are captured in a group and the faces which are detected are segmented. Then the segmented images are verified with the database of the class. Using a GSM technology, notification of absence will be sent through SMS for the particular student.

Mansi Patange et.al [ii] mentioned that student record maintenance is carried out manually by teachers through roll calling or by passing anattendance sheet. The drawbacks of this method are time consuming, prone to errors and proxy attendance. Moreoverdigital assimilation of records is tedious since teachers need to fill in the details in the database by themselves togenerate reports. In manual and digital records consistency also needs to be maintained. In the recent years, automated systems that have evolved use standard biometrics concepts. These systems are intrusive in nature and require expensive gadgetry. Thus our project design makes use of facial detection and recognition algorithms like to identify the students in the image captured by a basic camera. This image is uploaded in the software by using a USB cable where several algorithms detect the faces and compare it to the student image database in recognition phase. Daily attendance gets updated in the database automatically thereafter. The main advantage of this system is that it solves the redundancyproblem in manual records and makes attendancemaintenance, a convenient task.

Elijah O. Omidiora et.al. [iii] Focusedon maintaining the attendance record of both the students and the staff in academic institutions has always been an arduous task. It, therefore, calls for a system that automates the whole process of monitoring and controlling both students and

Lecturers lectures' attendance and maintaining the records. In this research, an automated system that controls and monitors both students and staff attendance was developed. This system takes attendance electronically using fingerprint identification. Using a fingerprint sensor, all the records are saved on a computer server. Fingerprint sensors and Liquid Crystal Display (LCD) screens are placed at the entrance of each lecture room. In order to mark the attendance, lecturer has to place his/her finger on the fingerprint sensor in order to mark the commencement of lecture and invoke sign-in process for the students to mark their attendance. On identification, lecturers' and student's attendance records are updated in the database and he/she is notified through LCD screen. The developed system was tested for a class of 43 students and two lectures at Kwara State College of Education Oro. To evaluate the performance of the model, questionnaires were administered to the students and lecturers that were involved in the implementation. Likert scale method was used to analyse the response of the people. The analysis of the result revealed that the developed system generated accurate and reliable students' lectures' attendance. It monitored and controlled lecturers' conduct of lectures.

UmarFarooqet. al. [iv] described the design of RFID based security and access control system in the hostels at Punjab University. The system combines RFID technology and biometrics to achieve its required task. The RFID reader is installed at the entrance of the hostel to detect a number; the system captures the user image and scans the database for verification. If both the card and captured image matches the registered user, access is permitted; otherwise the alarm makes an emergency call to the security through GSM modem. In this way, the suspicious persons can be caught.

K. Nasrollahi et al. [v] described that face is one of the important remote biometrics and it is used in facial analysis systems, like human-computer interaction, face detection and recognition. The face detection process was the initial stage for any face recognition system, surveillance system. The real-world challenge of these systems is all about working with low-resolution (LR) images. This is the issue that surveillance applications in public places need human operators to identify suspected individuals. Thus, it requires an automated system which is working with low resolution and low-quality faces. Super-resolution is a technique for obtaining high resolution (HR) image from more than one LR input images. Super resolution algorithms are mainly classified into two different classes: reconstruction based SR (RBSR) and learning-based SR (LBSR). The author focuses on extracting low quality faces from the video and convert it into high quality.

Unnati A. Patel et.al. [vi] Mentioned about the regularity of student attendance that happens in various institutions. Academic performance is highly affected because of the attendance in various institutions. The old technology used for marking attendance such as, by calling name of students or signing in paper but this consumes time and it's

inefficient. To overcome these issues various techniques of computerized system are being used.

Ravishankar Yadav [vii] gave a detailed description that RFID is a wireless identification technique which has become very popular these days. It is used for smart system that can be used to identify, monitor secure and do object inventory by the use of radio frequency. This technology is also used in Library Management System, Bank locker security system etc. The advantage of this technique is safe, secure, faster and easy to use with lower overheads in contrast with the other conventional techniques such as bar code, biometrics etc. It has two components i.e. RFID tag and RFID reader. RFID reader is the device capable of reading and retrieving information stored inside the RFID tags. This paper presents a design of an Automatic Attendance System for both students and professor with parent notification sent via GSM.

Rajni Sehgal et.al. [viii] presented the application of automating the attendance generation of students in academic institutions and acquiring feedbacks for further extension. Automatic face recognition and utilization of facial expressions is reaching its peak in research oriented fields such as creation of smart, artificially intelligent systems. This system adds as an advantage to reduce the manual labour, maintenance and other discrepancies and provides us with dependable results from real time analysis

Affandi et.al. [ix] Explained most of the companies were used a magnetic stripe card which is a type of card that enables storing data by modifying the magnetic property of tiny iron-based particles on a band of magnetic material on the card. Card has a Personal Identification Number (PIN) that allows accessing the account electronically. Nowadays, RFID card has been widely used in many organizations. The researcher used RFID card instead of a magnetic stripe card because it does not need a user interface. Here face recognition system is combined with RFID system by the researcher in order to support this security system. If the recognized face matches the PIN in the RFID card, through modem the response is sent to a remote station. The researcher mixes two types of security (FR and RFID) which make the security stronger and reliable. In turn, this gives the user more control. The lab program is developed and it met the design criteria and solves the paper problem.

Nurbek Saparkhojayeve et.al. [x] Stated that, In Kazakhstan, monitoring student attendance is one of the important issues in various universities. As many universities evaluate student attendance and while giving the final grade, professors consider their presence during the whole semester. This gives an idea of having some tool to control student attendance. Some universities prefer to use paper sheet for controlling attendance. However, this is not an efficient way since there will be spent much of time for calling students names and putting marks like presence or absence. After thinking all these issues, the authors created and implemented an attendance control system in Suleyman Demirel University,

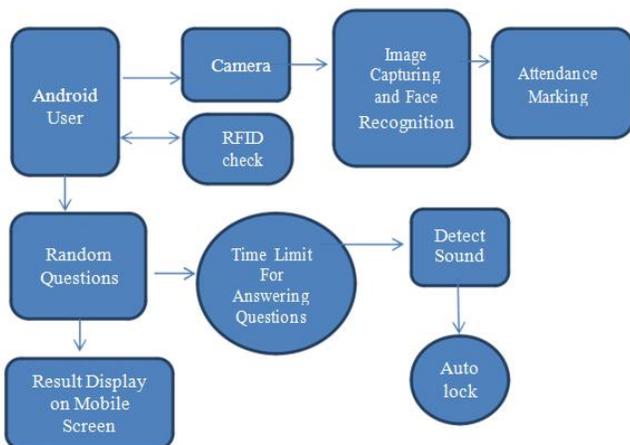
Kazakhstan. The system is based on RFID technology, and in this paper, details of this system and its methodology is given in detail. The main advantage of this creation is that we can check student attendance automatically.

Hlaing Htake Khaung Tin [xi] focused on Robust Algorithm which is presented for frontal face detection in color images. Face detection is an important task in facial analysis process. Applications such as face tracking, facial expression recognition, gesture recognition have a pre-requisite that a face is already located in the given image. Facial features such as eyes, nose and mouth are automatically detected based on properties of the associated image regions. The main advantage is that on detecting the face organs, a face verification step is applied based on Eigen face theory. The experiments were carried out on images taken from the internet. The algorithm has shown good real-time performance and good extraction results.

Manuel Gunther et.al. [xii] Focused on the relative relevance of Gabor amplitudes and phases for face recognition. It propose an algorithm to reliably estimate offset point disparities from phase differences and show that disparity corrected Gabor phase differences are well suited for face recognition. Based on CAS-PEAL database and FRGC database, 74.8% recognition rate on the Lighting set and 35.7% verification rate is reached

III. PROPOSED SYSTEM

In the proposed system, RFID system is used to monitor the student attendance but has some drawbacks. In the modification part is our implementation. In the examination hall every student is provided with System and RFID Reader. RFID tag is verified then Camera is initiated and Face Recognition is processed using Mat lab. Attendance system is made automatic. After verification, random set of questions are generated to the user. Time limit for answering every question is monitored and buzzer is initiated to the invigilator in case of any malpractice like, Detection of Sound, movement of student. Finally result is displayed on Screen and the Data is stored in Cloud server.



IV. CONCLUSION

This paper presented RFaceID, a multifactor authentication system for access control of services and restricted areas, which combines face recognition and token-based authentication for the sake of improved accuracy, reliability, and privacy. The system was specifically devised to work with very low resolution images, thus allowing the storage of the sensitive biometrics user data directly into the RFID tag, without any requirement for a centralized biometric database. To the best of our knowledge, RFaceID performs better, and with lower resolution face images, than the other approaches in the literature integrating RFID tags and biometric authentication. Moreover RFaceID achieved better FAR/FRR ratio than other state-of-the-art algorithms, such as Gabor Disparity. Furthermore, despite the low execution times and the small amount of data available, RFaceID is able to ensure an acceptable recognition output together with a low false acceptance rate even in presence of strong variations.

V. REFERENCES

- i. M.Vadiraj et.al "Face Recognition Based Attendance Monitoring System"
- ii. International Journal of Emerging Research in Management & Technology, Vol.5, May 2016. https://www.ermt.net/docs/papers/Special_Issue/2016/ICAE/135p.pdf
- iii. Mansi Patange et.al. "A conceptual model of automated attendance System using image processing" International Journal of Advanced Research in
- iv. Computer and Communication Engineering Vol.4, October 2015. <http://www.ijarcce.com/upload/2015/october-15/IJARCCE%2060.pdf>
- v. Elijah O Omidiora et.al "A Biometric-Based Model for Monitoring and Controlling Students and Lecturers' Attendance in Tertiary Institution"
- vi. International Journal of Advanced Research in Computer Science and Software Engineering, vol.5, Jan 2015.
- vii. https://www.ijarcse.com/docs/papers/Volume_5/1_January_2015/V5I1-0179.pdf
- viii. Umar Farooq et.al. "RFID Based Security and Access Control System"
- ix. International Journal of Engineering and Technology, Vol.6, August 2014. <http://www.ijetch.org/papers/718-B10136.pdf>
- x. K. nasrollahi et al., "Extracting a Good quality Frontal face Image from a Low-resolution video sequence," IEEE Trans. On Circ. And Syst. For Video
- xi. Tech vol. 21, Oct.
- xii. http://www.ijetae.com/files/Volume4Issue6/IJETAE_0614_36.pdf
- xiii. Unnati A. Patel et.al. "Development of a Student Attendance Management
- xiv. System Using RFID and Face Recognition" vol.2, April, 2014. http://www.academia.edu/9421523/Development_of_a_Student_Attendance_Management_System_Using_RFID_and_Face_Recognition_on_A_R_review
- xv. Ravishankar Yadav et.al. "Design of RFID Based Student Attendance
- xvi. System with Notification to Parents Using GSM", vol.3, Feb 2013
- xvii. <http://www.ijert.org/view-pdf/8172/design-of-rfid-based-student-attendance-system-with-notification-to-parents-using-gsm>

xviii. *RajniSehgal et.al. "Real Time Face-Recognition Based Attendance Generation and Perception Level Extraction" World Applied Science Journal 2014.*

<https://www.idosi.org/wasj/wasj29%286%2914/21.pdf>

xix. *ix.Affandi et al. "RFID and Face Recognition Based Security and Access*

xx. Control System,"International Journal of Innovative Research in Science, Engineering and Technology, vol. 2, Nov 2013

xxi. https://www.ijirset.com/upload/2013/november/6_RFID.pdf

xxii. x. NurbekSaparkhojayev et.al. "Attendance Control System based on RFID-technology" International Journal of Computer Science Issues,Vol.9,May2012

xxiii. <https://pdfs.semanticscholar.org/1d66/adeb751f1c42f148135135267b1c4777bd3.pdf>

xxiv. HlaingHtakeKhaung Tin "Robust Algorithm for Face Detection in Color Images" I.J.Modern Education and Computer Science,vol.2, 2012. <http://www.mecs-press.org/ijmecs/ijmecs-v4-n2/IJMECS-V4-N2-5.pdf>

xxv. M. Gunther et.al. "Face Recognition with Disparity Corrected Gabor Phase

xxvi. Differences," pp. 411-418, Springer-Verlag, 2012

xxvii. http://link.springer.com/chapter/10.1007/978-3-642-33269-2_52#page-1