

# Combined RFID-Biometric based MIS for student information

Miss. Prajakta Lokhande<sup>1</sup>, Miss. Dipali Kotkar<sup>2</sup>, Miss Pooja Nikam<sup>3</sup>

*Department of Computer Engineering  
Sir Visvesvaraya Institute Of Technology Chincholi, Nashik  
Tal.Sinnar, Dist-Nasik, Maharashtra.*

**Abstract**— RFID (Radio Frequency Identifier) and Biometric now a days are one of the most popular technologies in use today. This paper focuses on creating a MIS (Management Information System) system of student using both RFID and biometric (face-detection) technology. With the increasing number of students managing the attendance manually becomes a tedious and risky job. With the evolution in technology we propose a system which will take the attendance of a student, record it in the data base along with the other information. The system will provide the SMS alerts service which will give information about students attendance, marks etc.

**Keywords**— RFID reader, RFID tag, Face-detection, MIS, Haarcascade.

## I. INTRODUCTION

Most educational institutions administrators are concerned about student irregular attendance; along with maintenance of their academic record. Truancies can affect students overall academic performance. The conventional methods of taking the attendance (like by calling names or signing on paper), handling the students data though on computers manually, informing the parents about their wards performance (test marks, attendance, etc.) through letters, informing the companies about the students fulfilling their criteria by manually short-listing the students, is very time consuming, insecure and hence inefficient.

Thus, there is a need to bring about some changes in the current technology to manage student information. The objective of the paper is to provide a secure, easy & fast way to calculate the attendance of student, informing the parents about their ward, & short listing the students according to companies' requirements.

For this we are using combination of RFID and Biometric technology of face detection to mark the attendance of students. RFID is considered to be the most easy and fast way of detecting the physical object like humans, products etc as it has an ability to detect the objects using radio frequency. This makes RFID most efficient, easy, secure, and safe hence more advantageous with low overhead as compared to conventional method.

But as [2] RFID can only help us to answer the question “who I am?” but not “am I really the person who is entering?” i.e. we cannot completely identify the person so, we are going to use a combined RFID-Biometric system to take the attendance. This attendance along with the academic report (if any) will be send to parents through message; the application will itself short-list the students according to the requirements send by companies for campus recruitment.

## II. RELATED WORK

Various methods and techniques are being carried out so far to improve the attendance taking system and maintaining the records. This section describes some of them.

Zatin Singhal, Rajneesh Kumar Gujral [1] describes Remote Monitoring of attendance system based on RFID using GSM Network. In a test, it was found that it reduces time, manpower, cost (printing and paper), and eases the attendance record procedures

Noureddine Chikouche, Foudil Cherif, Mohamed Benmohammed,”An Authentication protocol based on Combined RFID-Biometric System,[2] which uses biometric hash function and robust hash function, ultimately providing the secrecy, authentication and privacy.

In the propose system author [3] uses figure prints technology to successfully take attendance both during lecture & examination by dividing process of identification in two stages of enrollment and authentication. In enrollment figure print registration is done and in authentication it will get compare with figure stored in database.

This paper [6] describes a techniques used in an iris recognition verifying system and wireless transmission. This system possesses the functions of iris recognition. In Propose system, Eye Scan sensor extracted minutiae from eye and it will be matched with template which is stored in database. System is designed and implemented using Daugman's algorithm. It can make attendance more easily and effectively.

### III. SYSTEM DESIGN

The system design of the system can be clearly understood from Fig1. As shown in the figure RFID reader and web-camera are connected to the server through RS232 and usb cable respectively. Both reader and camera will take their inputs (tag no and face image respectively) and compare it with the data stored in the database of the server, if correct match is found then appropriate action is taken.

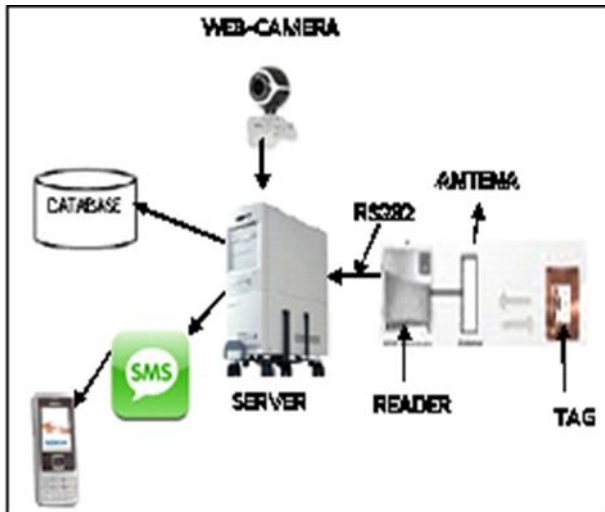


Fig 1: Structure of the system

#### A. Radio Frequency Identification

A system comprises hardware shown in Fig 2 known as readers and tags. RFID tags are of two major types, which include Active Tag and passive Tag.



Fig 2: RFID card and reader

RFID tags can be either passive, active or battery assisted passive. Passive RFID does not use a battery; they transmit low frequencies so they are detectable up to few meters of distance while an active has an on-board battery that always broadcasts or beacons its signal. A battery assisted passive has a small battery on board that is activated when in the presence

of a RFID reader. Active tags are active in nature i.e. they do not require any external source, they have their own in-built battery. It can transmit high frequencies so it can be detectable to a longer range.

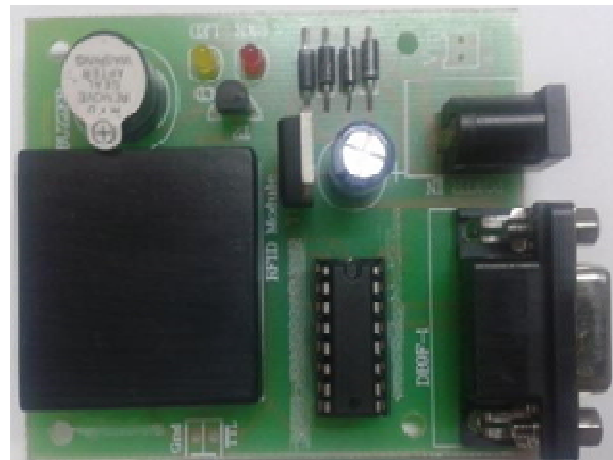


Fig 3: RFID reader RS232

Most RFID tags contain at least two parts: one is an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions; the other is an antenna for receiving and transmitting the signal. RFID Reader is a system which transmits and receives the data to the tag or key by radio waves. Depending on mobility, RFID readers are classified into two different types: fixed RFID and mobile RFID. If the reader reads tags in a stationary position, it is called fixed RFID.

These fixed readers are set up specific interrogation zones and create a "bubble" of RF energy that can be tightly controlled if the physics is well engineered. This allows a very definitive reading area for when tags go in and out of the interrogation zone. On the other hand, if the reader is mobile when the reader reads tags, it is called mobile RFID. In our system we are using RFID reader RS232, which Supports EM410x Series Unique Tags works at industry-standard 125 KHZ Frequency. It's Range up to 8-12cm.

#### B. Process of taking attendance:

System takes the attendance using the combination of both the outputs of RFID and face detection. The same is shown individually for better understanding:

- 1) *RFID Attendance System:* Following Fig.4 Gives details about System. RFID Reader and Web camera both are connected to Server. User or student Scan RFID Tag on Reader At the same time image of student will be captured by web camera. Both Reader and Camera take their individual inputs and send to server. Server extracts values from RFID reader and web Camera and check values in database. If match

will be found then it mark attendance and update Database. The System uses internet message Gateway system to send attendance report and class test marks on mobile phone.

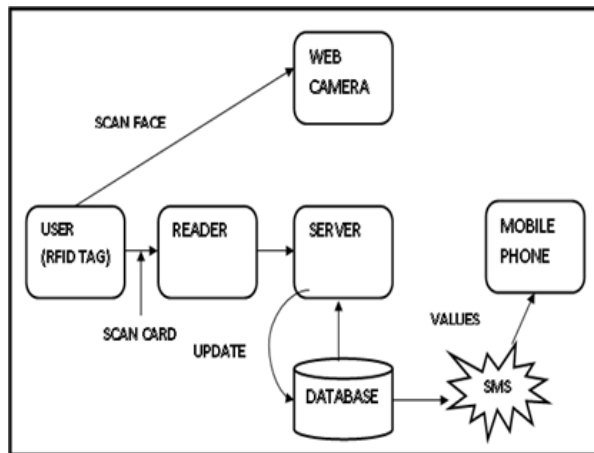


Fig 4: Block diagram of RFID attendance

- 2) *Face Detection:* Face detection technique used for student authentication. Following fig.5 gives details about face detection technique for student authentication. Camera will capture image of student then it send to server .server match this image with template image which is stored in student database. If match is valid then system performs action and update database.

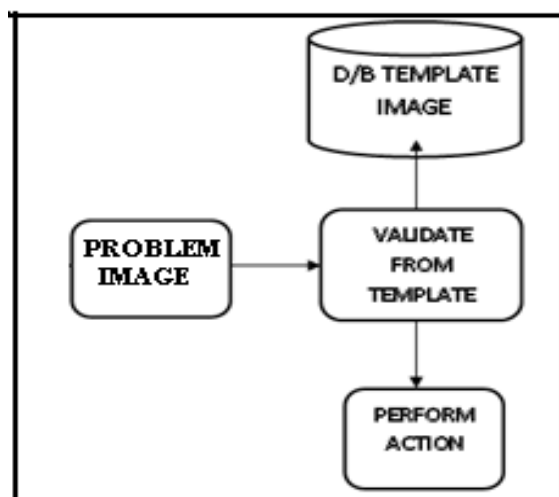


Fig 5: Block diagram for face detection

The face detection is carried out with the help of Viola-Jones object detection framework [7],[8].with the help of sum pixel calculation, rectangular node selection is done for the captured image. From this image haar features are calculated. These features are then organized into cascade classifier also called haarcascade to describe an object with sufficient

accuracy. This is then compared with the gray scale image stored in the database. The flow can be understood from figure 6.

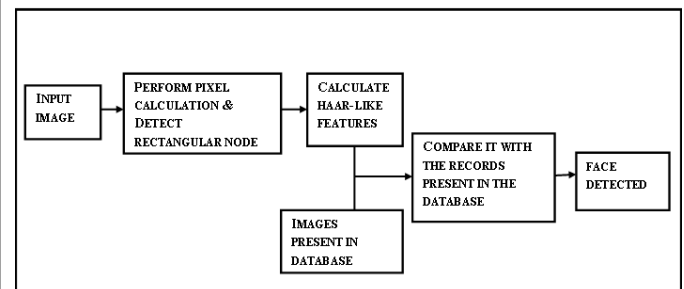


Fig 6: Flow-chart of face detection

### C. Database and Other Facilities:

Database consists of all the recorded data in different fields like ID, Name, Mobile No., Address, Attendance, Result, etc. Here, we are using My SQL as a database back end and .NET C# as front end for the user. There is main login form designed. The Login form contains labels, buttons, Textbox, Drop down list. Attendance will be stored in the database automatically through RFID face detection technology, rest of fields like marks; address, etc will have to be field manually. Test marks and attendance will be informed to students/parents via message. The system will provide the facility of short-listing the students according to company requirement.

Following are the snapshots of some designed screens:

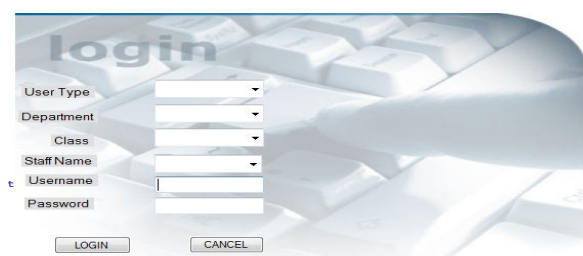


Fig 6: Login Window

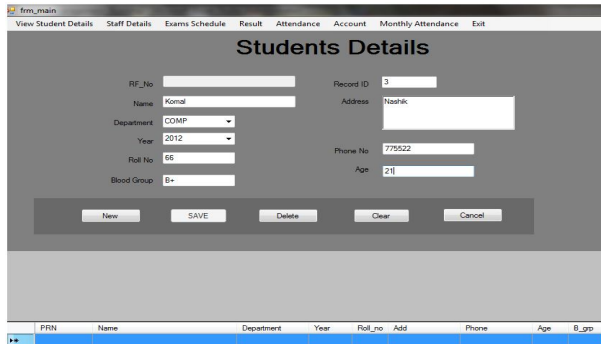


Fig 7: Student Details

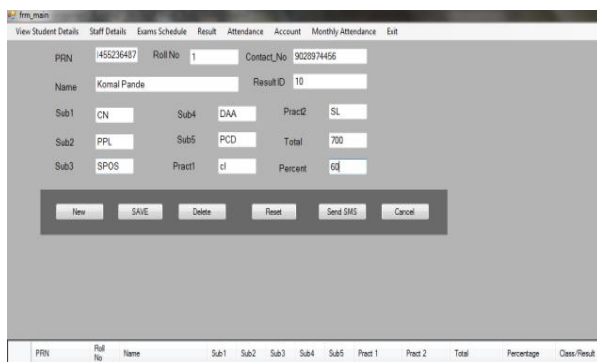


Fig 8: Result Details

#### IV. Conclusion

The system gives successful result to automatically calculate the attendance of student without doing any manual work. This proves to be lot of useful when attendance of large number of student is to be taken. The system helps to manage to student record, which in turns shortlist the student records according to the requirement of company. The system turns out to be lot of useful when there is large amount of data to be handled which become quite difficult to be handled mechanically. System reduces the overhead in the compilation of attendance, the student/parent knows average attendance and class test marks via SMS alert. Using RFID's along with biometric makes it easy to identify person correctly. They are easy to use, and save lot of time.

Hence we can say that "Combined RFID-BIOMATRIC" will act as an important tool in today's fast paced and techno-savvy world.

#### ACKNOWLEDGMENT

We would like to thank Prof .Sharad M Rokade, Head of computer department/our guide, Sir Visvesvaraya Institute Of Technology Chincholi, Nashik, for his valuable guidance and moral support, without which this paper would not have been possible.

We would also like to thank all other people who have worked earlier on this similar topic as their work has helped us a lot.

#### References

- [1] Zatin Singhal, Rajneesh Kumar Gujral," Anytime Anywhere-Remote Monitoring of Attendance System based on RFID using GSM Network", International Journal of Computer Applications (0975 – 8887) Volume 39– No.3, February 2012
- [2] Noureddine Chikouche, Foudil Cherif, Mohamed Benmohammed,"An Authentication Protocol Based on Combined RFID-Biometric System", (IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 3, No.4, 2012
- [3] O. Shoewu, O.A. Idowu," Development of Attendance Management System using Biometrics." The Pacific Journal of Science and Technology, Volume 13. Number 1. May 2012 (Spring)
- [4] Yao-Jiunn Chen, Yen-Chun Lin "Simple Face-detection Algorithm Based on Minimum Facial Features "The 33<sup>rd</sup> Annual Conference of the IEEE Industrial Electronics Society (IECON), Nov. 5-8, 2007, Taipei, Taiwan.
- [5] Jitao Sang, Changsheng Xu," Robust Face-Name Graph Matching for MovieCharacter Identification", Multimedia, IEEE Transactions, Vol. 14, Issue: 3, June, 12
- [6] Seifedine Kadry, Mohamad Smaili," Wireless attendance management system based on iris recognition", Scientific Research and Essays Vol. 5(12), pp. 1428-1435, 18 June, 2010
- [7] Zhaomin zhu,Takashi Morimoto, Hidekazu Adachi,Osamu Kiriya, Tetsushi Koide and Hans Juergen Mattausch,"Multi-view Face Detection and Recognition using Haar-like Features"
- [8] Paul Viola, Michael. J. Jones," Robust Real-Time Face Detection", International Journal of Computer Vision 57(2), 137–154, 2004