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Automated Attendance and Bus Transportation system using NFC and Face Recognition

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***Abstract*—Automated Attendance System played important role in the growth, and daily work process of our modernization. The main purpose of our system is to develop the automated attendance system is secure and safe. Attendances of all students are maintained in every school, college and university. Attendance system is a system that is used to track the attendance of a particular student and is applied in the industries, schools, universities or working places by using web camera, NFC tag and NFC Reader. The manual attendance record system is not efficient and this system requires more time to arrange the record and to calculate the average attendance of each student and this system can also maintain the record of staff of an institution. With the help of android application parent will be able to see the details of student. The details of student like term work, Marks, Attendance, etc. The proposed system should store the absent student's and present student's attendance details is stored in electronic format so that management of attendance becomes easy.**

This system also helpful for bus transportation. When a student getting entry into bus that time track the every student by using NFC reader and every student have NFC tag and this card have separate unique Id. Details of every student used by bus is in Admin like account of every students, Email-id, Address ,Billing information. When a student coming in college this time deduct the amount from this student account. When student come in college that time not deduct the amount from account that time send the message or mail to student and billing information will be display to student.

Keywords: NFC tag, NFC Reader, Attendance Monitoring, Automated-System, Android, Web Based Systems.

I. INTRODUCTION

Attendance of each student area is to maintain the every colleges, faculty, university of college must maintain the correct record of the student attendance. Attendance system is track the attendance of every person to apply the every college, industries or operating places. The manual attendance of record system isn't economical and needs to rearrange this record and to calculate the common attendance of every student. The normal approach for taking attendance of student is downside .As this methodology is employed ,several student area serving to their language within their attending just in case of their absent in institute.

Hence demand's the system to solve the problem of student record arrangement and to calculate the average of student attendance. This technology is based on the attendance of student system like good cards and this system is mostly based on the attending system reduced human environment and errors. This project is also store the student related data to absent student related data in electronic format in order that management of attendance of system is becomes straightforward.

II. TECHNOLOGIES AVAILABLE FOR AUTOMATING ATTENDANCE REGISTER

This section compares three existing technologies that may be used for this purpose. They are,

1. Barcode systems
2. Biometric systems
3. RFID systems

The comparison shown in Table 1 is made by considering parameters such as data density, cost, data reading speed and influence of interference between reader and data carrier. These parameters are considered important if automating the student attendance register.

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TABLE I: Comparison between different automatic identification systems and our proposed system.

Parameters	Barcode system	Biometric systems	RFID systems	NFC system
Data density	Low data density	High data density	High data density.	Very high data density.
Influence of covering the data carrier	Total failure of system	Total failure as system works on contact	No influence	No influence
Influence of direction between reader and data carrier	Failure - if no line of-sight communi--cation	Not applicable as direct contact is needed	No influence as data are transferred via radio waves	No influence as data are transferred via near field communication
Operating Cost	Low	High	Low	Low
Distance	0-50cm	Direct	0-6 m	About 10 cm

III. LITERATURE SURVEY

A..Developing a Java based RFID application to automate student attendance monitoring.[1]

Author: R.B. Kuriakose, H.J. Vermaak

The R.B. Kuriakose suggested a pilot experiment rolled out at the Central University Of Technology, Free State, South Africa where a Radio Frequency Identification Technology (RFID) application. It is used the java based RFID application and used to automate attendance monitoring.

B. A Web Enabled Secured System for Attendance Monitoring and Real Time Location Tracking Using Biometric [2]

Author: Srinidhi MB, Romil Roy

In this paper Srindhi M.B. suggested to develop a safely and securely web based attendance monitoring system using Biometrics. This system also maintain the attendance records of both students and teachers/staff members of an institution.

C. Classroom Attendance System Using Facial Recognition System[3]

Author: Abhishek Jha

Abhishek Jha The suggested the two PCA algorithm for face detection and PCA and LDA. It is used for feature extraction . This whole system is implemented in MATLAB. The main advantage of their system is that, the student can also keep track of their attendance by their own login id.

D. Multi-modal Authentication System for Smartphones Using Face, Iris and Periocular.[4]

Author: Kiran B. Raja R. Raghavendra Martin Stokkenes Christoph Busch

In this paper Kiran B. suggested a multi-modal biometric system, which uses face, periocular and iris biometric characteristics for authentication.

E. Modest Face Recognition

Author: Vitomir Struc, Janez Krizaj, Simon Dobrisek[5]

In this paper Vitomir Struct suggested a novel framework for face recognition that relies on probabilistic models of Diverse feature Sets (MODEST) to facilitate the recognition process and benchmark it against the existing state-of-the-art. We demonstrate the feasibility of our MODEST.

IV. SYSTEM ARCHITECTURE

In this System architecture our proposed system uses the NFC card and face recognition for automated attendance system. We use NFC card for student for student attendance and bus transportation to read the tag data by using NFC reader. Student gets entry into class then capture photo student by web camera and read image and verify student from our attendance system. When found recognized images then match the student image from database and mark the attendance. All student information like test marks, monthly attendance, term work send to parent by Android application. In the bus transportation system we use NFC card for student. when student get entry into bus then track the student by using NFC reader and deduct amount from the student credit and Notification send to the bus coordinator.

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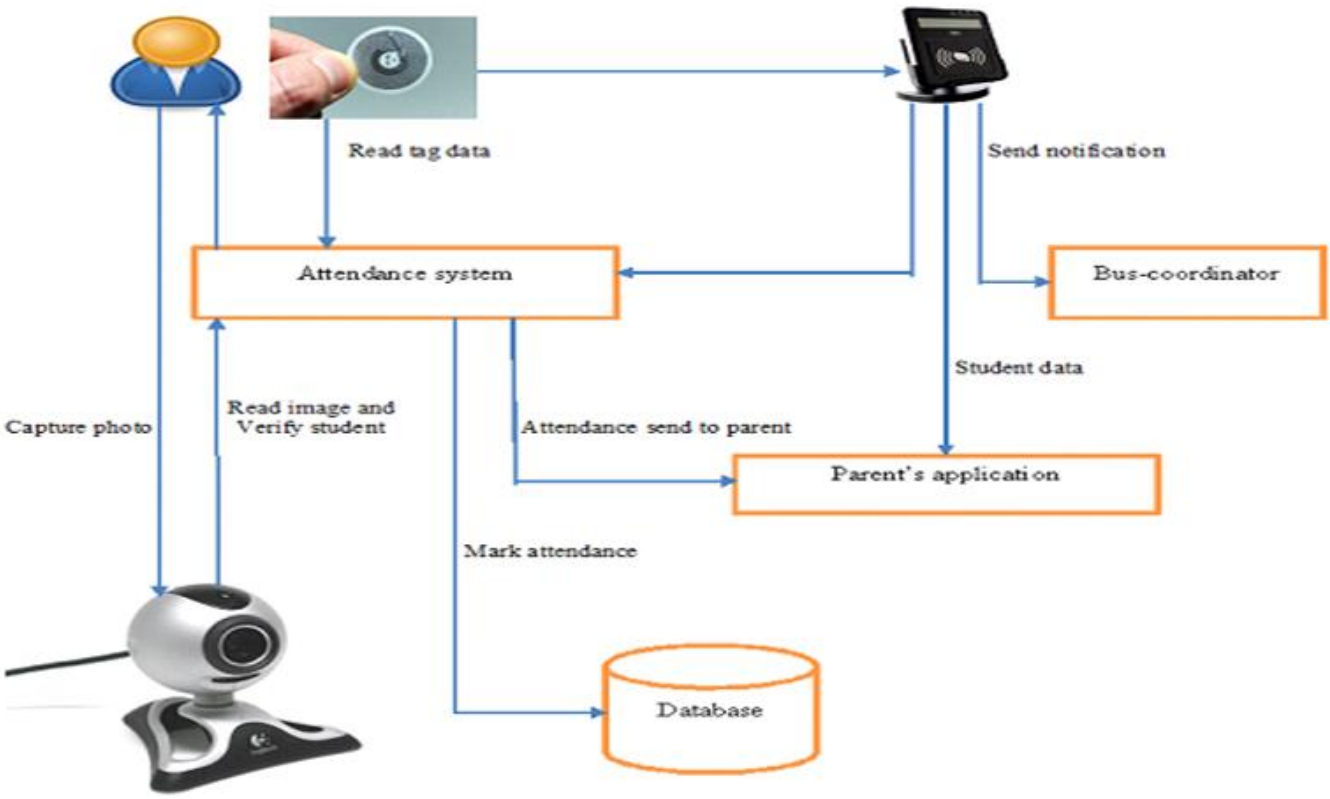

Fig 1. System Architecture

In our proposed system architecture given modules are:

A. Attendance System

When student enters in classroom the system matches the face of the student by using that database. This system uses camera and NFC card for marking the attendance of each student every day.

B. Database

In this database store the information about student images, marks. When student enters in classroom the system matches the face of the student from that database.

C. Bus Coordinator

When student enters into bus then to track the student and send notification to bus coordinator and parent and deduct the amount from student credit account.

D. Parents Application

In this the given application for the student's attendance report is uploaded on the parents application or login. Parent will able to see the information about child by using android application.

E. NFC Tag

The working of NFC tag is to embed the data of student and to read the tag data by NFC reader, automatically mark the attendance of student.

F. NFC Reader

The working of NFC reader is to read the data from NFC tag. If the NFC tag is passed out from the nearest area of the reader then also it is recognized by the reader.

V. ALGORITHMS

A. HAAR-cascade

The HAAR-cascade algorithm use for only the intensity of the image and calculate the value of image in RGB pixel at each and every pixel of image and the calculation of the task is computationally expensive. The feature of HAAR-cascade algorithm is to consider the rectangular adjacent region is at specific location in detection window, intensity of each pixel region and calculate the difference between these regions. HAAR-cascade algorithm is to calculate the region of image is i.e. eyes and cheeks then common observation of all faces among the region of eyes is darker than the region of the cheeks. To detect the by using two adjacent rectangles i.e. it

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lie above the eye and the cheek region. This position of rectangle is to define the detection of the window and it acts like a bounded box to target object.

B. Template

This template matching algorithm is use face recognition algorithms. It includes Pixels, samples, models as pattern uses a template matching process. The function of recognition is to calculate the differences between these features. This template matching algorithm is used Correlation or distance measures. It also matching the 2D images it was the early trend, and 3D is used nowadays in templates. This problem is using Elastic Bunch of Graphs it represent the images. Template matching algorithm is to calculate the HSV value of image and value of each pixel of image. It compare the all and each value of image then it matches the value.

VI. MATHEMATICAL MODEL

A. Subordinate functions

Identify the processes as P.

$$S= \{I, O, P....\}$$

$$P= \{FR, AR, BS, BA\}$$

Where,

FR is face recognition system

AR is attendance register using NFC

BS is billing system

BA is Bus attendance system.

p is process

$$FR= \{U, R, CP\}$$

Where,

U is user face image

R is a template matching face recognizer.

CP is attendance generated at gate for student if the student is recognized by face recognition

$$AR = \{RR, AS, Log\}$$

Where,

RR is NFC recognizer which will collect information from users NFC.

AS is Attendance system which will mark attendance of the student.

Log is maintained and saved on server. Test result and attendance summary is sent to students parent.

$$BS = \{RR, B, Info\}$$

Where,

RR is NFC recognizer which will collect information from users NFC.

B is billing process which will deduct amount from students credit.

Billing info will be displayed to student.

$$BA=\{NFC\ tag, AA, Log\}$$

Where,

NFC tag is used by students for getting entry into bus.

AA is attendance system which will recognize student information from NFC tag.

Log is maintained for attendance of student.

VII. FUTURE SCOPE

We can also implement this system for various institutes associates for on department. For e.g., If one student went to another institute for any educational purpose then also its attendance should be marked from this system.

VIII. CONCLUSION

This proposed system gives attendance record of students via NFC and Face Recognition. Typically, students' attendance is marked by the lecturer manually which spends a lot of time. Also amount of proxies gets recorded in manual system. NFC will mark the attendance robotically when student's card is passed through the reader and student enters the class. While face recognition will assist in validating student and marking the attendance of that individual student ensuring avoidance of proxies.

References

[1] Developing a Java based RFID application to automate student attendance monitoring.
[2] A Web Enabled Secured System for Attendance Monitoring and Real Time Location Tracking Using Biometric.
[3] Classroom Attendance System Using Facial Recognition System.

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[4] Multi-modal Authentication System for Smartphones Using Face, Iris and Periocular.
[5] MODEST FACE RECOGNITION.
[6] M. Landin and J. Perez, "Class attendance and academic achievement of pharmacy students in a European University," *Curr. Pharm. Teach. Learn.* vol. 7, no. 1, pp. 78–83, 2015.
[7] H. Vermaak and. RB Kuriakose, "Using reflective practices to reduce dropout rates among first year students at a University of Technology, a South African perspective," in *Frontiers in Education conference*, 2014.
[8] Sumita Nainan, Romin Parekh, and Tanvi Shah. RFID technology based attendance management system. International Journal of Computer Science, 10(01):516–521, 2013.

[9[C.H. Chan, Tahir M.A. J. Kittler, and M. Pietikainen, "Multiscale local phase quantization for robust component-based face recognition using kernel fusion of multiple descriptors," *IEEE TPAMI*, vol. 35, no. 7, pp. 1164–1177, 2013.

[10] Automation of attendance system using rfid, biometrics, gsm modem with .net framework. International Conference on Multimedia Technology ICMT, IEEE, pages 2976 – 2979, 2011.