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DIGITAL CLASSROOM WITH AUTOMATIC ATTENDANCE AND E-NOTICE BOARD BASED ON GSM & BIOMETRIC AUTHENTICATION

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Abstract: -

Objectives: The main objective of this research is "Digital Engineer Classroom".
Methods: The analysis has been done by various methods that make our classroom more innovative and dedicative. The different effective techniques are considered to find the suitable most efficient technique.
Findings: To make our classroom digitalized and more innovative.
Application/Improvements: This Digital Engineer Classroom display can be used for Advertising or providing information at various places like schools, colleges, government offices, shops, hospitals, railway stations. The widescreen Digital monitor will become a valuable display aid for instructions, schedule information, data display or promotional messages.

Keyword: promotional, schedule, innovative.

I. Introduction

There is many innovative technology implemented in foreign University classrooms but it still were not implemented in our Indian classroom because of lack of awareness in classroom usage. Given these shortcomings; developed a "Digital Engineer Classroom". This project engaged with the actual situation and this makes our classroom more innovative and dedicative.

In the student identity model "Face detection and Recognition method based on skin color and Depth Information" is in the domain of image processing. A major portion of information received by a human from the environment is visual. Hence, processing visual information by computer has been drawing a very significant attention of the researchers over the last few decades. The process of receiving and analyzing visual information by the human species is referred to as sight, perception or understanding.

This technology uses PIC microcontroller, mobile phones to transmit the information from staff to the student within the fraction of second without the presence of staff. In current scenario many of the school and college using the bulletin board for sharing the information to the students. It is wastage of paper and time. To avoid those complexities, we include mounted one display unit along the two sides of the classroom that can help student to view update of the department activities and technical information.

This digital class room will sense the student entry through the IR sensor or RFID tag and display the total number of students present and absent in the outside display unit of the class room. The faculty information and

the subject for the particular period can be displayed in the outside display unit using biometric sensing system or time scheduling bases.

During the class hours, technical information, department events and updates displayed in the indoor display unit. During the free hours the information from mentors to the students will be displayed through the Text SMS or Voice which is entered by the mentor handy mobile device or microcontroller unit with microphone based GSM technology.

This Digital Engineer Classroom display can be used for Advertising or providing information at various places like schools, colleges, government offices, shops, hospitals, railway stations. The widescreen Digital monitor will become a valuable display aid for instructions, schedule information, data display or promotional messages.

The following characteristics are going to implement in this project. They are,

- Display unit **outside** the classroom
  - It will display the total student present and absent in the class room using **BIDIRECTIONAL COUNTER SENSOR**.
  - It will also display the corresponding staff name at the particular period by **FACIAL RECOGNITION.**
- Display unit **inside** the classroom

  During Free hours it will display the following information given below which is sent by the mentor of each class via TEXT SMS or VOICE SMS.

  Using mobile phone,
  - Technical information
  - Department &College events and activities
  - Current affairs

Internal and university exam schedule.

II. Literature survey

Manual entering of attendance in log books becomes a difficult task and it also wastes the time. Reading out the names of each student, each hour destroys the precious time. To gain the precious time this paper uses the fingerprint sensor to manage the attendance records of students. Our module enrols the student's as well as staff's fingerprints. This enrolling is a onetime Process and their fingerprints will be stored in the fingerprint sensor. During enrolling of fingerprints the roll number as your fingerprint id which will be unique for each student and staff. After enrolling process gets completed you can disconnect the module from the system and insert a 9v battery into the module. The presence of each student will be updated in a database and the data will be passed to the server using Wi-Fi. If a student is absent for a particular class automatically a SMS will be sent to their parents.

If a student is absent continuously for more than three days a message intimating the parents to meet the HOD will be sent automatically. So everything here gets automated. Also a unique username and password for staff members are given in a website we create and the website can display the student's details, their attendance percentage which makes the work simple. Also mails and messages can be sent by the staff members using that site to intimate any urgent messages to the parents.[4]

This paper describes the design and implementation of a prototype automatic identity-authentication system that uses fingerprints to authenticate the identity of an individual and also use the minutiae-extraction algorithm that is faster and more accurate than our earlier algorithm. An alignment-based minutiae-matching algorithm has been proposed.[2]

This algorithm is capable of finding the correspondences between input minutiae and the stored template without resorting to exhaustive search and has the ability to compensate adaptively for the nonlinear deformations and inexact transformations between an input and a template. The NIST 9 fingerprint data bases have been used to estimate the performance numbers. A complete authentication procedure, on average, takes about 1.4 seconds on a Sun ULTRA 1 workstation.[19]

This paper solve the basic problem of student attendance management is defined which is traditionally taken manually by faculty. Student's overall academic performance is affected by the student's present in his institute. Mainly there are two conventional methods for attendance taking and they are by calling student names

or by taking student sign on paper. Hence, there is a requirement of computer-based student attendance management system which will assist the faculty for maintaining attendance of presence. The paper reviews various computerized attendance management system. One alternative to make student attendance system automatic is provided by Computer Vision. Based on this review a new approach for student attendance recording and management is proposed to be used for various colleges or academic institutes.[7]

This project is designed using ARM-LPC2148 interfaced with Graphical Display. Also in present electronic systems, no matter how many displays are present, only a single notice can be sent to all of the notice boards irrespective of their places. To overcome this disadvantage, multiple displays along with a decoder are used to select a particular display and the corresponding information is sent through an ARM controller by using GSM technology. The entries can be documented and a record may be maintained for future use by using visual basic. The monitoring system consists of an image sensor which captures the images for the specified amount of time and the images can be transferred through an USB port to a PC for storage purposes.[6]

An E-CIRCULAR SYSETEM consisting of code number was designed, and also transmitting the data through wireless medium and data is displayed on the LCD display in the corresponding classroom or lecturer hall or some other places. The transmitter side is the principal room and he can send the messages whatever he wants to inform to this college staff or student using pc or mobile and the transmitted message is received through the GSM modem.[7]

III. Comparison of methodologies

This section provides an overview about the pros and cons that are occurred in the research methodologies whose functional scenarios are discussed in depth in the previous section. From the following table, it can be predicted a better approach that provides considerable improvement in the proposed scenarios.

Table 1. Comparison of Research Methodologies

S.NO	TITLE OF PAPER	AUTHOR NAME	MERITS	DEMERITS
1	Kernel Principal Component Analysis	Bernhard Schoolkopf1, Alexander Smola2 and Klaus	High detection accuracy High sensitivity	This approach is more costly.
2	An Identity-Authentication System Using Fingerprints	ANIL K. JAIN, LIN HONG, and SHARATH PANKANTI	The expected work run as fast on a 200HMz Pentium.	Its takes more time for scanning the finger.
3	Process of Detecting Barcodes Using Image Processing	Kopila Pariyar	High accuracy Time consuming	Waste of time.
4	A Foolproof Biometric Attendance Management System	Karthik Vignesh E and Shanmuganathan	Computerised method make time consuming.	Manual attendance takes more time.
5	Display message on notice board using GSM	Foram kamdar, Anubhav Malhotra and Pritish Mahadik	Avoid waste of precious time.	At present, information has to be updated in a notice board, it has to be done manually it make waste of time.
6	On Face Recognition Using Gabor Filters	Al-Amin Bhuiyan and Chang Hong Liu	Gabor transformation processing time is reduced to less than 1sec.	Processing time is more.
7.	Simple Face-Detection Algorithm Based On Minimum Facial Features	Yao-Jiunn Chen and Yen-Chun Lin	High average accuracy High precision High recall	It requires further improvement

IV. Conclusion

The process of a classroom and staff-student communication has been implemented properly in this project. In many colleges there have been large difficulties for this process to take place, if it happens also it doesn't reach to the student in time. To avoid the graphical notice board has been developed inside the class room itself .So student can receive all the notifications from the corresponding staff properly and within the specified time. The student presence is also an important part in this project. So this project has developed an attendance system to monitor them. The RFID system plays an important role in monitoring them individually. The authority can know about their daily presence. This system can be improved by updating student attendance through online web system to their parents and providing finger print recognition to each individual student. The main motive is to enhance the student activities by monitoring them by providing proper RFID access system.

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