Biometric based Classroom Monitoring System

Saro Rishvanthi K[1], Sowmiya B[2], Varshini M M[3], Reshma B Nair[4]

[1,2,3] *Department of Information Technology, Sri Krishna College of Engineering and Technology, India*

[4]*Assistant professor, Department of Information Technology, Sri Krishna College of Engineering and Technology, India*

***Abstract*— This project deals with face detection for an attendance recorder system for the purpose of maintaining attendance details of the students. Students faces are pre stored in class databases. Camera captures the student face and compared to database image if it is unmatched means that student is unauthorized to particular class room. And based on Biometric identification attendance will marked for every particular time period.**

Index Terms— Biometric, Identification

I. INTRODUCTION

The attendance of students in class rooms is important one and mandatory in all schools, colleges and other institutions for evaluating the students' presence. The conventional available methods which involve inking the attendance register manually is inefficient process and time consuming one. This system enables remembrance of pupils' face methodology for automated attendance capturing in classroom without any disturbance. This system consists of digital-camera which captures the pupils' face image periodically i.e. one hour duration in the class, detects the pupils' face image and compare it with the faces already stored data in database and if the face image matches attendance will be recorded ,and if particular face is not observed then attendance will be marked as absent.

Hence all the details-face images of pupils'-are stored and recorded in data base in the server. During the attendance marking, initially one should apply face recognition technique, the images of the pupils' should be captured in the camera, then the captured image will be detected and that will be matched with anyone in database by means of segmentation and object detection. Biometric identification means, the face images are compared and if it matches the available pupils that will be recorded and will be displayed in the website. Each and every faculty can log in the database by providing an ID and password using that everyone can access the attendance information in the website.

Since the latest digital technology is evolving tremendously, the educational systems can co-opt this system as the conventional inking the register. The conventional attendance inking process involves good amount of precious man hour resources, stationery, and a time consuming process. With face recognition attendance system, the faculties can monitor more on students' progression very easily.

The prime objective of this work is to develop a homogeneous system that will record fool proof attendance system with arbitrary questions about the curriculum courses. This methodology consists a database and a website. Pupils' attendance monitoring becomes a peculiar one, because of the various arbitrary questions issued from the database collection of questions, which is processed by a device program.

A face detection system is to rely on individuality or character for each and every face that stumble on by checking equivalent to it with a huge record of individuals. Automation of detecting and recognising the pupils 'face is a tedious task for a number of years. Though the mankind carries out this job in a facile manner, the concealed calculation within the human optic system are of stupendous entanglement. Besides, the potential to discover the pupils' faces optically in any scenario and to recognize them is difficult for the mankind in their day today activities. Hence, 2D image is utilised for detecting the pupils' face. In spite of this the system must be able to perform non-contrived recognition to identify and recognize the faces.

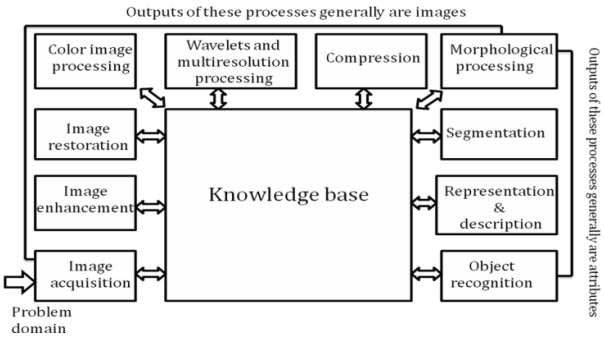

Fig. 1. Fundamental steps in image processing

II. LITERATURE REVIEW

A detailed survey was carried out in the existing literature in brief on the various documents, websites and back volumes on attendance monitoring by latest digital processing. Using these divergent techniques, a new novel technique for pupils' attendance record in evolved.

A. Review

Attendance of individuals has become a main part in assessing the present education system in colleges and schools. The conventional attendance management system has tremendous drawbacks. The system assist in diagnosing the present location of the individuals, and members within the province of institution's premises. This application helps to collect live coverage of numerous task within premises, update with the contemporary topics in respective registered domain and also maintain the record of the present location of their

friends on a actual time taken. The usefulness of this attendance performance map in the system, which gives a design of the student's stability in attendance of entire semester [1].

At the attendance time when employees impress their fingerprints, against the scanner, the system compares the new fingerprint patterns and the connection between various points in the fingerprint with the enrolment database. A match is documented as a bang exercising acquisition, processing, transmission, matching. Through this automatic system, time and manpower is reduced to the great extent. The correctness of the system depends on the quality of the fingerprint. Here accuracy is measured by means of False Rejection Rate (FRR) and False Acceptance Rate (FAR). During result testing, this transmitter module gives only two incidents of false rejections for 50 authorized identification attempts. Hence FRR of the transmitter module is 0.04 %.Upon observation; the system also gives one true result for 50 unauthorized user attempts. Thus the system maintains FAR of 0.02%.A program is coded in 'C' language to implement the algorithms for enhancement, minutiae extraction and matching processing. Apart from that, MATLAB was used to demonstrate the various functions and processing methods used in image processing of the fingerprint. The outputs for all the trial runs were recorded. On observation, the designed system gives satisfactory results [2].

The portable classroom paper launches fingerprint based attendance monitoring system which helps in addressing the drawbacks of the existing paper based attendance method or long time queue. In addition, our biometric fingerprint based system is encrypted which preserves data integrity. In addition, our biometric fingerprint based system is encrypted which preserves data integrity. In higher learning institutions such as universities, attendance is made compulsory for every student in order for them to understand the subject matter taught in class. With the existence of the fingerprint scanner, it has been made easy for educators such as lecturers to record student attendance [3].

In multimodal biometric paper they present a result to acquire useful and consistent user logs in a Learning Management System (LMS). Current LMS logs are combined with biometric-based logs that show the student behaviour. Our system models the student behaviour, allowing knowing exactly how much time the student spends in front of the computer examining the contents of the LMS. Besides, user verification and face tracking are also integrated, what guarantees that the student is the person actually interacting with the system. Fingerprint or speaker verification is performed on demand, with the aim of avoiding a negative influence of adverse environmental or behavioural human factors in the reliability of the user logs generated by the system. These circumstances can thwart the non-collaborative face verification performance involved in the tracking process [4].

The objective of this work is to make a sketch and implement an Iris identification based attendance monitoring system with the current opportunity at an attainable amount to think about financial situation of the large figure of developing countries. This work includes two parts, as hardware and software. The Iris is a circular diaphragm that punctured because of the pupil and lies between cornea and lens. How much light can enter through the pupil, a circular aperture area is controlled by the iris. The accomplishment of this process satisfies the needs of attendance management in almost all institutions. By exploiting the benefit of advanced data analysing techniques, the cost of basic hardware unit was successfully reduced. The proposed outcomes will help one to go for a low cost attendance system just using a pc, web-cam and wireless server [5].

III. Research Methodologies

A. *Existing System*

All the educational institutions like university, colleges, and schools adopt the conventional manual attendance inking practice that involves human resource and consumes much time; and in some of the institution, attendance is monitored by Radio Frequency Identification card RFID method. In this pupils' attendance is recorded by RFID to show the presence / absence.

B. *Proposed System*

In the proposed system, the adopted techniques for attendance monitoring are face segmentation, processing, compression, object detection, image restoration, image enhancement, image acquisition techniques.

The recognition capacity of the infrared IR can be expanded for image, video and text, the prime research attempts an emphasis on the text partitioning and magnification. To remove the non- image area in each binary picture, easy joined constituent investigation process is occupied by fixing the conditions on size, height and width aspect ratio etc. The parallel approach usually comprises of the following steps, pre-processing, recognition and an optional post- processing. In each step, the respective operations are carried out to recognize, detect, segment and partition the image to match with the existing in database as in Fig.2.

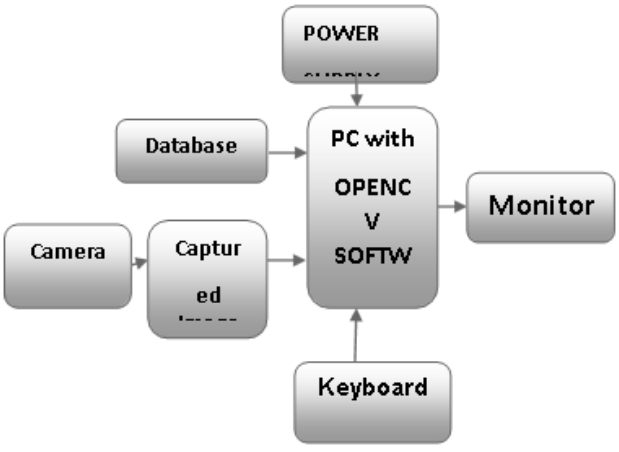

Fig. 2. Proposed Schematic Diagram

The proposed system consists of 4 modules, namely

1) Database feeding module

2) Live Capturing module
3) Comparing fetched parameter with stored parameter module
4) Attendance Update module

IV. Conclusion

The developed smart digital based attendance system is advantageous compared with conventional manual recording system with the help of digital image processing, object recognition, compression techniques etc. This can be widely employed in human resource management HR areas for effortless attendance monitoring to replace the existing physical contact system.

V. Future Enhancements

The paper doesn't deal with the complete recognition of student's face in all the angles and enhancement can be done to reduce the influence of background regions whereas, that with the Machine learning and Deep learning concepts with the help of the artificial Intelligence devices such as raspberry-pi and arduinos. So that the students attendance can be made more effortless and bug free.

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