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Student Attendance Marking Using Face Recognition in Internet of Things

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ABSTRACT
The attendance maintenance system is the major performance evaluation of the student. In recent periods, the student attendance is maintained in the system manually and updated in the particular college server. In proposed system, we implements a IOT based web camera technique. In this the student image is captured while registration process and saved in the database with all the relevant and personal information. To calculate the attendance the student image is captured in which the details are fetched from the database. The daily attendance is updated in the database by the administrator. When the particular student image is captured, then the details is fetched from the database. The student attendance can be updated to database and database send the attendance details to parent by mobile sms system.

Keywords:- Face Recognition, Sensors, Face Detection

I. INTRODUCTION

IoT(internet of things) is the process refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items not normally considered computing device with unique identifiers object, animal and people. There is no single, universal definition. IoT implementations use different technical communications models, each with its own characteristics are device to cloud, device to gateway, back end data sharing. These models highlight the flexibility in the ways that iot devices can connect and provide value to the user.

Every Academic Session Student information systems provide capabilities for registering students in courses, documenting grading, transcripts, results of student tests and other assessment scores, building student schedules, tracking student attendance, and managing many other student-related data needs in a college. Students have unique registration number, Name ,Father Name, Location all details are stored in data base. To maintenance and reporting the students detail.

Staff management may involve moving a workforce around and utilizing Human Resource. HR planning is needed for staffing, to consider the skills, knowledge, and attributes needed when hiring new staff. HR will also look at the number of staff needed and who they believe are the most qualified. Staff qualification, Department, handling Subject are update in the database and also Staff having a separate Login to update the students details. view the students detail and update attendance detail. the attendance detail send sms to parents.

Face recognition is a computer application capable of identifying or verifying a person from digital image or a video frame from video source by comparing selected facial features from the image and a face database and biometric method of identifying an individual by comparing live capture or digital image data with stored record for that person. Face recognition systems based on faceprints can quickly accurately identify target individuals when the conditions are favorable.

Sensors detection are used in everyday objects such as view sensor and capture the image to detecting the base, besides innumerable applications. Moreover sensors such as potentiometers and force-sensing resistors are still widely used. Photosensors or photodetectors are sensors of light or other electromagnetic energy A photo detector has a converts light photons into current using (passive infrared sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR- based motion detectors.

The students are registered in the college application that time they give his/her Photo. Every

day Capture the student image for attendance updation. If capture image and registration photo both are compared and update to the attendance detail after that details are stored in the data base. Every day Attendance will be updated in the data base. The both images are compared and update the details in attendance update after the images are matched the attendance is present otherwise the student is absent. Attendance updation sends to parents and stored in college data base.

II. RELATED WORK

Abhishek Jha [1] proposed the face is the identity of a person. The methods to exploit this physical feature have seen a great chance of image processing techniques. The accurate recognition of a person is the aim of a face recognition system and this identification maybe used for coming processing. The methods can be facial recognition are: International Conference on Audio and (AVBPA) and(AFGR). The facial recognition process can be divided into two stages: processing before detection where face detection and alignment and recognition occur through feature extraction are face detection, face alignment, feature extraction, face matching so on its providing an automated attendance system for all the students that attend a certain lecture, section, laboratory or exam at its specific time, thus saving time, effort and reduce distractions and disturbances.

Bhawna Dhupia, Nabil Litayem, Sadia Rubab [2] proposed the wide variety of mobile devices available the challenge is developing innovative mobile learning solutions for class .But an important challenge here is to confirm the presence of students in class. They are used two methods are electronic attendance system and mobile learning system. Attendance is a very basic task student during class using mobile send teacher's photo through email and teacher check email and mark attendance of the student. A platform independent mobile learning system is a web based application and it provides an which is a mobile implementation of student response system provide a quick feedback to teachers about student performance. If sensing and web cam are used, fake attendance problem is resolved, but if students sit on the same seat as on a bench or student frequently changes seat than accuracy of face detection and identification are affected a large number of samples of each student highlight a major problem.

Chrisford Ling, Patrick Laytner, Qinghan Xiao [3] proposed the biometric systems have become an increasingly popular solution for security related applications. Retina and fingerprint scanners upon to accurately perform an wide range of tasks including authentication of personnel to restricted sites and identification of individual persons. Facial recognition is a rapidly growing area its non-contact nature,a human face, detecting a face in an image, the first step to perform facial recognition, is by no means a simple task, such as Principal Component Analysis (PCA), Hidden Markov Models (HMM), and HAAR-like features, the skin color properties in several common color spaces such as RGB, Normalized RGB, and HSV. HAAR-like features have been widely used in different ada boosting algorithms and object detection, face detection. An Ada Boost-based algorithm is used to select features that are used for facial classification a collection of them to form a stronger and more reliable classifier of the biometric system.

Dennis Haufe, Manuel Gunther, Rolf P.Wiirtz [4] proposed the Gabor wavelet responses at single locations of facial images are collected into Gabor jets, which are extracted at several offset positions and assembled into a Gabor graph *G*. Often, the identity of a probe image, it is compared with several gallery images and assigned the identity of the most similar gallery image. Image comparison is traced back to the comparison of the two Gabor graphs extracted from these images. *Elastic bunch graph matching* (EBGM), the correspondence problem is solved locally by computing offset position corrections, so-called *disparities*. The CAS-PEAL images are partitioned into a gallery of 1040 images with ambient illumination and neutral facial expression, and different probe sets. We here process the probe sets *Expression* and *Lighting*. The *Expression* probe set contains 1570 images with ambient illumination, showing one of five facial expressions. The *Lighting* probe set consists of images with neutral expression, but strong fluorescent illumination from fifteen different directions and one frontal incandescent illumination. The *Face Recognition*

Grand Challenge (FRGC) database in version 2.0 consists of 36818 facial images of 466 persons taken under controlled or uncontrolled lighting with some expression.

Divyaharitha P, Gayathri B, Safiya Parvin A [5] proposed the Attendance plays a vital role in schools and universities as a prior record of a student. Fake attendance is happening to be common nowadays due to which problems on misbehaving arise. Ultrasonic is a sensor, which is used to detect a person's movement. This sensor detects the action of any object or person within a second. The student tracking methodology is done by this sensor with the help of camera used for attendance. These actions are done with MATLAB software application.The face recognition is suggested to avoid fake attendance there is a possibility of marking fake attendance just by showing the card for even bunking students by their friends, The sensor which is used in detecting the misbehave student in the class time. As the ultrasonic sensor is placed above the door step which continuously produces waves and measures the way and so if any student passes the door so they are used in attendance marking.

Eu Jun Chin, Wei Jen Chen, Florence Choong [6] proposed the Capturing the attendance of people is a task commonly performed every day, Biometric authentication is the process which utilizes unique human traits in order to accurately identify a person. since the optical sensors require direct contact with the student, the risk of it being damaged or getting dirty can be high when used by many people. for attendance capturing purposes which can involve a large group of people; face recognition for attendance capturing, precious time can be saved as the system will take the attendance of the students automatically with sensor device. the whole class monitoring by the video cam and all students activity can be stored in the database for student attendance marking. They are using few methods are face recognition, face detection, tracking, attendance marking, graphical user interface and so on.

Hteik Htar Lwin, Aung Soe Khaing, Hla Myo Tun [7] proposed the automatic personal identification in access control has become popular by using biometrics data instead of using cards, passwords or pattern.The automatic control methods are viola-jones face detection and principal component analysis, This method consists of three main steps. The first step of the Viola-Jones face detection algorithm is to turn the input image into a new image representation called an integral image that allows a very fast feature evaluation. To extract the relevant features of facial images, Principal Component Analysis (PCA, Face Recognition based on PCA is generally referred to as the use of Eigen faces.

Mamtha G, Rajeshwari M, Srivardhini P [8] proposed the Internet of Things allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber physical system. The records occupy huge amount of physical space for storage. The manpower required for taking attendance, record maintenance, storage, retrieval and modification is huge. Thus, by automating this system, The Radio-Frequency Identification (RFID) tag contains electronically stored information that is read by an RFID scanner. But an RFID access control system involves the problem of the cardholder not being the actual owner. In this system also many face detection and face recognition can be obtained at particular value are used on attendance.

Michihiko Minoh, Weijane Lin, Tetsuo Shoji [9] proposed if the attendance of a student of classroom lecture is attached to the video streaming service, It is important to take the attendance of the students in the classroom automatically. The attendance value can be define at particular value at the shooting plan of the sequence number of the data fusion of the lecture attendance,seat by using the background subtraction and inter-frame subtraction of the image from the sensing camera on the ceiling. They have few methods are shooting plan, architecture, existence value our system selects one seat from the estimated sitting area obtained by ASD, directs the camera to the seat and captures images. the face images are detected from the captured image, archived and recognized. Face

detection data and face recognition data are recorded into the database.so the many product can be define at particular value of an student attendance marking.

Naresh Babu N.T, Vaidehi V, Vasuhi s [10] proposed the Human Verification rapidly growing research area due to increasing demands for security in commercial and law enforcement applications. Person authentication involves verification of a person's identity based on his/her physiological or behavioral characteristics. Most image-processing techniques involve the image.although there exist several holistic and feature based face recognition algorithms such as Principal Component Analysis (PCA), Fisher Linear Discriminant analysis, Image Principal Component Analysis (IMPCA), Independent Component Analysis(ICA), Orthogonal Locality Preserving Projections (OLPP) and various other methods, the theoretical concept of face recognition is not satisfied by the existing systems

III. PROPOSED WORK

The PIR (passive infrared sensors) is an electronic sensor which measure infrared light radiating from objects in its field of view and its PIR-based motion detectors. This PIR sensor detect motion image and capture the image through sensor device. In this chapter, the method used Arduino board to connect through PIR sensor. On this methods, Arduino UNO board because it is the most popular board in the Arduino board family. it is the best board to get started with electronics and coding with image capture and most Arudino have majority board components.

ARDUINO RESET CONNECTION:

Arduino board can reset and start your program from the beginning ,you can

ANALOG PINS:

The arduino UNO board have five analog input pins A0 to A5 and pins read the signal from an analog sensor like the humidity sensor or temperature sensor and convert it into the digital value that can be read by the microprocessor.

MICROPROCESSOR:

Arduino board has its own microcontroller and its brain of your board. the main integrated circuit your board has before loading up a new program from the arduino IDE and available on the top of the IC.

POWER LED INDICATOR:

This LED should light up when you plug your arduino into power source to indicate that your board is powered up correctly and light does not turn off,then there is something went wrong with the connection.

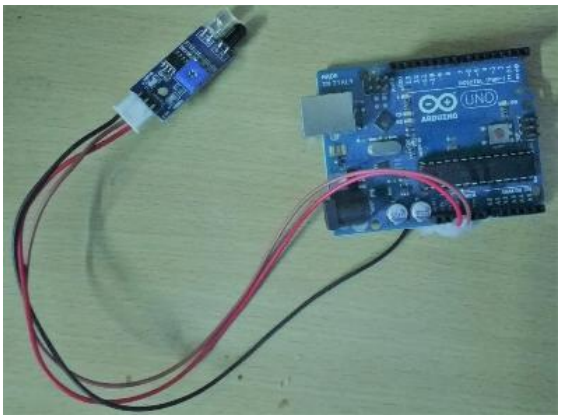

Fig1.Passive Infrared Sensor

IV. SYSTEM DESIGN

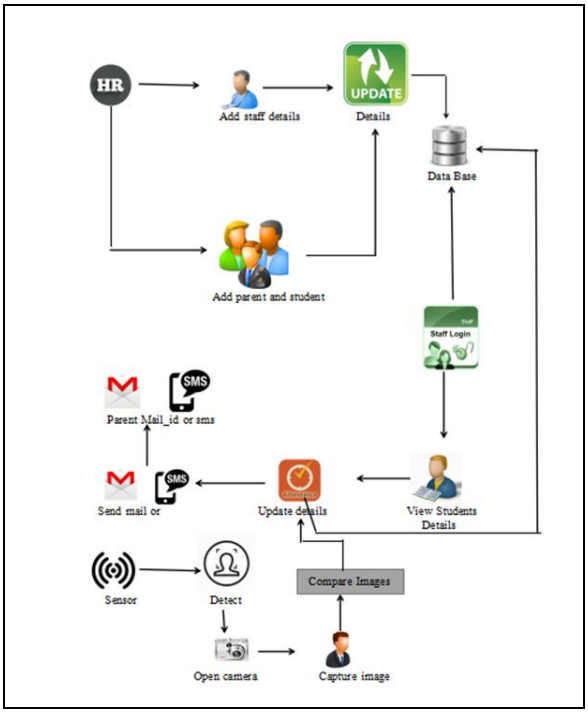

Fig 2. System Architecture

As show in Fig 2 The human resource can be create staff details and update details and once again

create the student and parent details and update details and all information can be gathered and send through database. In this section the staff login can collect all details and staff have separate login for student to update the student detail and student attendance everyday staff can be collect and update details through database. In this sensor can be detect through open camera and capture image and already we registered the his/her image through student detail and compare the image and updated through the update details and all updated detail send through database. The database can check through the update details and send sms through parents regarding student attendance marking.

V. RESULT AND ANALYSIS

As show in Fig 3. The Every Academic Session Student information systems provide capabilities for registering students in courses, documenting grading, transcripts, results of student tests and other assessment scores, building student schedules, tracking student attendance, and managing many other student-related data needs in a college. Students have unique registration number, Name ,Father Name, Location all details are stored in data base. To maintenance and reporting the students detail.

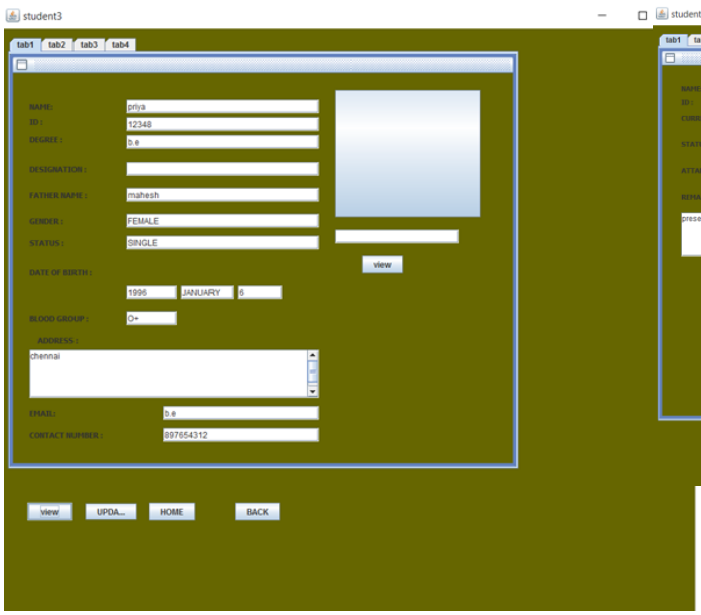

Fig 3. Student login detail

As show in fig 4. The PIR (passive infrared sensors) is an electronic sensor which measure infrared light radiating from objects in its field of view and its PIR-based motion detectors. This PIR sensor detect motion image and capture the image through sensor device. In this chapter, the method used Arduino board to connect through PIR sensor. On this methods, Arduino UNO board because it is the most popular board in the Arduino board family. it is the best board to get started with electronics and coding with image capture and most Arudino have majority board components. The students are registered in the college application that time they give his/her Photo. Every day Capture the student image for attendance updation. If capture image and registration photo both are compared and update to the attendance detail after that details are stored in the data base.

As show in Fig 5. Every day Attendance will be updated in the data base. The both images are compared and update the details in attendance update after the images are matched the attendance is present otherwise the student is absent. Attendance updation sends to parents and stored in college data base.

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Fig 5. Attendance Update

VI. CONCLUSION

An student attendance management is a necessary tool for any attendance marking. Most of the existing systems are time consuming and require for a semi manual work from the teacher or students. The process is not only time consuming but also sometimes inefficient resulting in the false marking of attendance. It focuses on building an efficient and user friendly Attendance Monitoring. When registration process, the student details are obtained with the image of the student. While calculating the attendance, the image is again captured and fetches the attendance from the database. This is implemented using web camera based on IOT (Internet of things). This will take few seconds to calculate the attendance of the students and very helpful in fetching the details from the database.

REFERENCES

[1] Abhishek Jha, "Class Room Attendance System Using Facial Recognition System",IEEE The International Journal of Mathematics, Science, Technology and Management (ISSN : 2319-8125) Vol. 2 Issue 3,2015.

[2] *Chirsford Ling, Patrick Laytner and Qinghan Xiao* "Robust Face Detection om Still Images", in IEEE in 2014 IEEE Symp. on Comp. Intell. in Biometrics and Identity management (CIBIM), pp. 76–80, Dec 2014.

[3] Dennis Haufe, Rolf P.Wiirtz and Manuel Gunter "Face Recognition With Disparity Corrected Gabor Phase Differences" pp. 411–418, Springer-Verlag, 2012.

[4] Divyaharitha p, Gayathri B, Safiya Parvin A "Automated Of Attendance and Student Tracking With Face Recognition And Ultrasonic Sensor" IEEE transaction 2013.

[5] Nabil Litayem, Bhawna Dhupia, Sadia Rubab " Automatic Attendance and Mobile Learning System in Sensor Enabled Heterogeneous and Dynamic University Environment" International Journal of emerging technology and advanced engineering(ISO 9001:2008 certified Journal, Volume 4,Issue 12,December 2014).

[6] Eu Jun Chin, Wei Jen Chen and Florence Choong "Automatic Attendance Capture and Tracking System" Journal Of Engineering Science and Technology EURECA 2014 Special Issue January (2015) 45 – 59.

[7] Hteik Htar Lwin, Aung Soe Khaing, Hla Myo Tun "Automatic Door Access System Using Face Recognition" International Journal Of Scientific & Technology Research Volume 4, Issue 06, June 2015.

[8] Mamtha G, Rajeshwari M, Srivardhini P "Automated Attendance Marking" International Journal For Research in Applied Science and Engineering Technology(IJRASET),Volume 4,Issue 4,April 2016.

[9] Michihiko Minon, Weijane Cin, Tetsuo Shoji "Face Recognition Based Lecture Attendance System" IEEE Transaction June 2013.

[10] Naresh Bbu N.T, Vaidehi V,Vasuhi S " Person Authenciation Using Multiple Sensor Data Fusion" ICTACT Journal On Soft Computing, April 2011, Volume: 01, Issue: 04