

A Survey on Student Attendance Marking using Face Recognition in Internet of Things

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Abstract— The face is the identity of a person. The design and construction of automatic attendance marking and parent alerting System order an ideal environment for teaching in classes. The Attendance is taken in every schools, colleges and library. Traditional approach for attendance is professor calls student name & record attendance. Suppose duration of class of one subject is about 50 minutes & to record attendance takes 5 to 10 minutes. For each lecture this is wastage of time. To avoid these losses, we are about use automatic process which based on image process which is based on image processing. In this novel approach, we are using face detection & face recognition system. Face detection differentiates faces from non-faces and is therefore essential for accurate attendance. The other strategy involves face recognition for marking the student's attendance. The sensor module is used for face recognition and face detection. The camera will be connected to the sensor. The student database is collected. The database includes name of the students, there images & roll number. The installed at the front side of class in such a way that we can capture entire class. Thus with the help of this system, time will be saved and it is so convenient to record attendance. We can take attendance on any time. The detail of the student will be sent to corresponding department and their parents using GSM technology.

Key words: Face Recognition, Sensors, Face Detection

I. INTRODUCTION

IOT (Internet of Things) in a wider context. Main enabling factor of this concept is the integration of various technologies. the key technologies involved in the implementation of Internet of Things and the major application domain where the Internet of Things will play a vital role. The basic idea of this concept is the presence of a variety of objects such as sensors, actuators, mobile phones, etc. which, through unique addressing schemes, are able to interact with each other). The future is Internet of Things, which will transform the real world objects into intelligent virtual objects. The Internet of Things (IoT) has also gained significant attention over past decade. IoT envisions to connect billions of sensors to the internet and experts to use them for efficient and effective resource management in smart cities .today, infrastructure, platforms and software applications are offered as services using cloud technologies. IoT is a technological revolution that represents the future of computing and communications, and its development depends on dynamic technical innovation in a number of important fields, from wireless sensors to nanotechnology.

II. LITERARY SURVEY

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 Video-Based Person Authentication (AVBPA) and the International Conference on Automatic Face and Gesture Recognition (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 reducing distractions and disturbance.

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 time, place and person for 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 solved, but if two students sit on the same seat as on a bench or student frequently changes seat than accuracy of face detection and identification are affected moreover a large number of training samples of each student highlight a major problem of memory requirement.

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 are relied upon to accurately perform a 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 boosting algorithms and object detection, especially 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 2243 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.

Divyavaritha 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 fraction of second. The student tracking methodology is done by this ultrasonic sensor with the help of camera used for attendance. These actions are done with MATLAB software application. The face recognition, where this system is suggested to avoid fake attendance i.e. there is a possibility of marking fake attendance just by showing the card for even bunking students by their friends, The ultra-sonic sensor which is used in detecting the misbehaving 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 without the need for human intervention. 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) method is used. 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 is a 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 treating the image as a two-dimensional signal and applying standard signal-processing techniques to it. 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. METHODOLOGY

An attendance marking system, which integrates computer vision and face recognition algorithms into the process of attendance management. The system is implemented using a non-intrusive sensor camera installed on a classroom, which scans the room, detects and extracts all faces from the acquired images. After faces have been extracted, they are compared with an existing database of student images and upon successful recognition a student attendance list is generated and saved on a database. This paper addresses problems such as real time face attendance list is generated and saved on a database. This paper addresses problems such as real time face detection on environments with multiple objects, face recognition algorithms as well as social and pedagogical issues with the applied techniques. the video camera is started to take photos of the person. Then the face can be detected in a short time. The identity information in the card is compared to the information from the database and the corresponding face data will be obtained. If the identity information and the face data are all matched to the information from the database, the person will be passed.

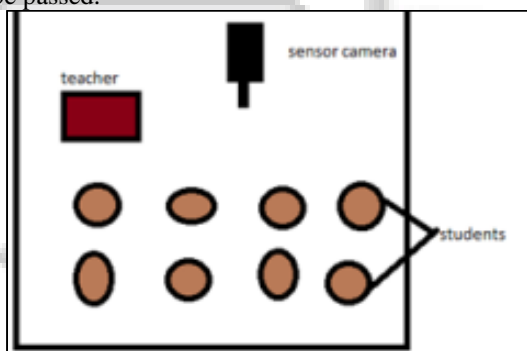


Fig. 1: classroom setup

The different stages of this hardware design includes skin color detection, morphology, Fast connected-component labeling algorithm, Implementation of the Fast connected-component labeling algorithm, Lip feature extraction, Horizontal edge detection.

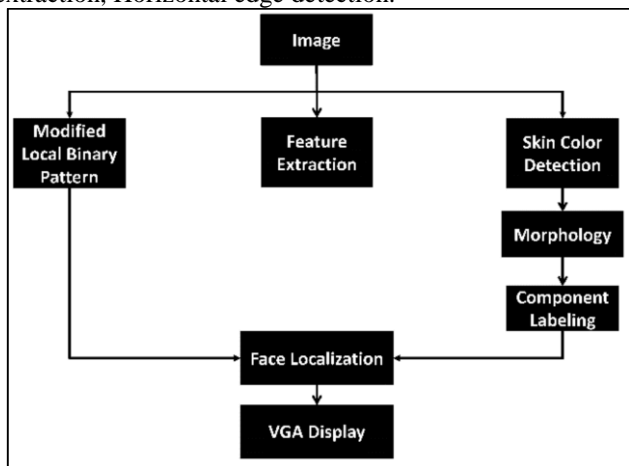


Fig. 2: Step process

IV. CONCLUSION

An automatic attendance management system 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. This approach solve the issues by face recognition in the process. this system still lacks the ability to identify each student present on class, there is still much more room for improvement. Since we implement a modular approach we can improve different modules until we reach an acceptable detection and identification rate. Another issue that has to be taken in consideration in the future is a method to ensure users privacy. Whenever an image is stored on our servers, it must be impossible for a person to use that image.

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