

Computerized Attendance Management System Based On Face Recognition Algorithms Using WEBCAM

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ABSTRACT

An automated participation executive system, which is depends upon face acknowledgment and recognition calculations, thus distinguishes the understudy when he goes into the classes and mark the participation by Identifying him. Particular ongoing circumstances are considered to assess the execution of different face acknowledgment systems. This paper other than proposes the methods to be used so as to deal with the dangers like caricaturing. At the moment that stood out from conventional participation indicating this system spares the time and moreover observe the students

Keywords- Face Recognition, LBP, SVM.

I. INTRODUCTION

In cutting edge time of computerization numerous logical progressions and innovations have occurred to spare work, increment the exactness and to improve our lives. Computerized Attendance System is the advanced that has occurred in the field of automation replacing conventional Automated Participation Systems are for the most part bio-metric based, smart card based and electronic. These systems are commonly used in unique associations. Customary technique for participation checking is very tedious and attendance checking movement. ends up confounded when the quality is high. Computerization of Participation System has edge over conventional technique as it spares time and besides can be utilized for security purposes. This additionally averts counterfeit participation .An Participation Management System which is created utilizing bio-measurements, for our situation face, by and large comprises of image Acquisition, Database advancement, face acknowledgment, pre-handling, Highlight extraction, and Classification stages pursued by Post-preparing stage.

The consequent Sections in this paper are writing review, point by point portrayal of different arranges in the proposed model, results and closures and degree for development. A Face acknowledgment System is a Computer application fit for perceiving or confirming an individual from a advanced picture or a video outline from a video Source. One of the ways to deal with do this is by looking at chosen facial highlights from the picture and a face database.

II. OVERVIEW

The system is useful in images with establishments and forefronts that are both splendid or both dull. In particular, the technique can prompt better perspectives on bone structure in x-beam pictures, and to all the more promptly detail in photos that are finished or under-exposed. A key favored stance of the methodology is that it is a really clear system and an invertible administrator. So on a basic level, in case the histogram leveling limit is known, at that point the first histogram can be recovered. The figuring isn't computationally raised.

A disadvantage of the system is that it is unpredictable. It may grow the separation of establishment fuss, while reducing the usable signal. In coherent imaging where spatial relationship could without much of a stretch contrast with power of sign, (for instance, disconnecting DNA areas of quantized length), the little sign to commotion proportion by and large hampers visual detection. Histogram night out normally conveys preposterous effects in photography; anyway it is significant for coherent images like thermal, satellite or x-beam images, regularly a comparable class of images that client would apply false-color to Additionally histogram leveling can make unfortunate impacts (like recognizable image angle) when associated with image with low shading significance. For example, at whatever point associated with 8-bit image appeared

with 8-bit-gray- scale palette it will also diminish color depth (number of excellent shades of dim) of the images.

Histogram equalization will work when associated with images with significantly higher color, profundity than palette estimate, as steady data or 16-bit gray scale Pictures. . There are two Different approaches to consider and execute histogram alteration, either as image change or as palette change. in most cases palette change is better as it saves the first information. Generalizations of this technique utilize different histograms to emphasize local contrast, as opposed to generally speaking difference. Instances of such techniques incorporate flexible histogram modification and complexity confining adaptable histogram adjustment or CLAHE. Histogram equalization also seems to be utilized in natural neural systems to boost the output firing rate of the neuron as an element of the information measurements. This has been exhibited explicitly in the fly retina. Histogram equalization is a specific example of the more broad class of histogram remapping methods. These methods hope to change the image to make it less difficult to dismember or improve visual quality (e.g., retinex)

III.LITERATURE SURVEY

The author B.K. Mohammed and C. Raghu, title as “Fingerprint participation system for study hall need” in India proposed as Face acknowledgment is a basic field in numerous applications, one which is Participation Management System. Presently days taking the participation of the student in the classroom had turned into a dull activity for instructors like getting out their names sitting tight for reaction and furthermore keeping up this participation till the month to create participation report.In this way face discovery and acknowledgment module distinguishes faces from the picture captured by the camera, and the image of the face is is stored. The author T. Lim, S. Sim, and M. Mansor,titles“Rfid based attendance system,” in Industrial Electronics & Applications, 2009. Radio-frequency identification (RFID) is an advancement that uses radio waves to exchange data from an electronic tag, called RFID tag or label, associated with an object, through a reader for the goal of distinguish and following the objectt. RFID innovation which is a developed innovation that has been generally sent by different associations as a component of their mechanization systems. In this examination, a RFIDbased system has been worked in order to deliver atime-attendance the executives systems.The creator ISris acknowledgment

confirmation is a standout amongst the most dependable individual ID strategies in biometrics With the quick improvement of iris acknowledgment check, some of its applications have been proposed as of not long ago including time participation system and so on.

In this paper, a remote iris affirmation support the board system is arranged and executed using Daugman's calculations. This system based biometrics and remote system deals with the issue of false cooperation and the inconvenience of laying the relating system. It can make the clients attendances even more adequately and easily.An interchange kind of taking data for face acknowledgment is by using warm cameras, by this system the cameras will simply distinguish the condition of the head and it will ignore the subject accessories , for example, glasses, caps, or make up. An issue with utilizing warm pictures for face acknowledgment is that the databases for face acknowledgment are constrained. Diego Socolinsky, and Andrea Selinger (2004) investigate the utilization of thermal face acknowledgment, in actuality, and activity landscapes, and in the meantime construct another database of thermal face images.

The examination utilizes low-sensitive, low-goals ferro-electric electrics sensors that are fit for obtain long wave thermal infrared (LWIR). The outcomes demonstrate that a combination of LWIR and standard visual cameras has the more noteworthy outcomes in open air tests. Indoor results show that visual has a 97.05% exactness, while LWIR has 93.93%, and the Fusion has 98.40%, anyway on the open air demonstrates visual has 67.06%, LWIR 83.03%, and combination has 89.02%. The examination utilized 240 subjects over the time of 10 weeks to make the new database. The information was gathered on bright, blustery, and overcast days. This examination work focuses on face acknowledgment issue as a piece of unimodal biometric system and after that moves towards the mix of face and unique mark highlights to get a powerful multimodal biometric systems.

IV.PROPOSED SYSTEM

The system Design is as appeared in Fig.1. The proposed mechanized participation management system depends on face recognition algorithm. At the point when an individual goes into the class room his picture is caught by the camera at the entrance. Face district is then removed and pre-handled for further preparing. As not past what two people can enter the classroom at a time face detection algorithm has less

work. Face Recognition shows to be perfect than different systems as examined about in the Table 1. At the point when the student's face is recalled that it is supported to post-processing. The System count is discussed. The organizes in the proposed Automated Attendance Management System are as appeared in the Fig.1. Technical details of implementation of each stage are discussed about in the accompanying segments..

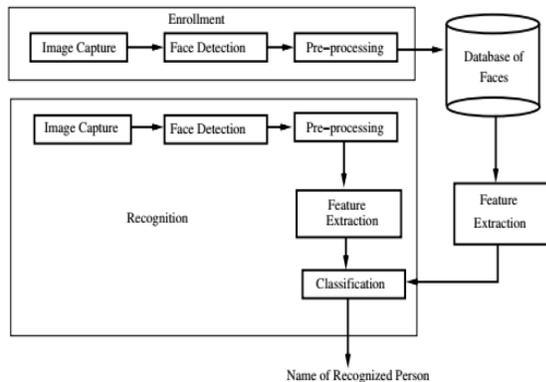


Fig.1: Proposed system block diagram
Image Capture

The Camera is mounted at a division from the passageway to capture the frontal pictures of the students. The caught Image is needed to be of the size 640x480 to abstain from resizing of the picture in the back-end as we watched resizing may as it were, achieves poor execution

Face Detection

A proper and effective Face detection algorithm dependably upgrades the execution of face acknowledgment systems. Different algorithms are proposed for face detection, For example, Face geometry based methodologies, Feature Invariant techniques, Machine learning based techniques.

Out of all of these procedures Viola and Jones proposed a structure which gives a high acknowledgment rate and is moreover fast. Viola-Jones detection algorithm is capable for progressing application as it is speedy and strong [5] Henceforth we picked Viola-Jones face detection algorithm which uses Integral Image and AdaBoost learning algorithm as classifier. We saw that this computation gives better results in different lighting conditions and we solidified diverse haar classifiers to achieve a better area rates up than an edge of 30 degrees

processing

The detected face is removed and presented to preprocessing. This pre-planning step incorporates with histogram equalization of the evacuated face image and is resized to 100x100. Histogram Equalization is the most generally perceived Histogram Normalization strategy. This improves the separation of the picture as it expands the extent of the powers in a image by making it all the more clear.

Database Development

As we picked biometric based system enrollment of every individual is required. This database advancement stage involves picture catch of every individual and isolating the bio-metric element, for our circumstance it is face, and later it is improved using pre-handling systems and put away in the database. In our undertaking we have taken the images of individuals in different edges, distinctive articulations and furthermore in different lighting conditions. A database of 80 people (NITW-database) with 20 images of every has been gathered for this project

Feature Extraction and Classification

The execution of a Face Recognition system furthermore depends on the element extraction and their course of action to get the precise results. Feature extraction is accomplished using feature based systems or sweeping strategies. In some far reaching strategies we can use dimensionality decline before characterization. We looked at the consequences of various all encompassing methodologies utilized for highlight extraction and grouping progressively situation. Principal Component Analysis (PCA) was the main algorithm that addresses the appearances financially. In PCA the face images are addressed using eigen faces and their relating projections along each eigen face. Instead of using the entire all of the segments of an image simply significant estimations are considered to address the image. Logically a picture image using PCA is spoken to as

$$\chi = WY + \mu$$

Where χ is the face vector, Y is vector of eigenface, W is the component vector, and μ is the average face vector. These projections (feature vectors) are then used as arrangement features in face acknowledgment. Later Fisher's Linear Discriminant Analysis (LDA) was proposed in which

the ratio of between-class scatter and inside class scatter maximizes PCA doesn't consider the discriminative information in the data where as LDA stores the discriminative data in the information. LDA may perceive a image in all around lit up condition yet bombs in terrible lit up conditions. There are a couple of cases wherein PCA defeats LDA and the a different way. [6] Local Binary Pattern Histogram (LBPH) is starting late proposed algorithm for face feature extraction. In this procedure LBP picture is divided into close by districts and histogram of each is expelled and are connected to shape a face descriptor[7]. Exactness of a system realized using PCA and LDA are affected by database measure which isn't the circumstance in LBP. [8] all things considered features removed from PCA and LDA are presented to evacuate classifiers. The detachment between the features of test picture and features of arranged pictures is resolved. In the event that the separation is not exactly the edge, at that point the test image is perceived.

$$e_i = \min | | \omega - \omega_i | |$$

Where e_i is euclidean separation ω is image vector and i is number of prepared image. Nevertheless, we can make use some machine learning algorithms for better classification. PCA is used for feature extraction and Support Vector Machine (SVM) is used for the arrangement. SVM is as of late proposed calculation which is viable example characterization algorithm. For instance acknowledgment SVM finds the perfect division of closest concentrations in the planning set. This partition should be possible directly or non-straightly. In certifiable circumstance we require a multi-class classification. Support Vector Classification, a SVM type, is used for multi-class gathering. Credulous Baiyes classifier is a clear classifier which acknowledge opportunity of features of a class. In Bayes Classification Small measure of preparing information is sufficient for estimation.

So Face Recognition incorporates into two stages, include extraction and grouping. The recently referenced feature extractors got together with classifiers are contemplated in various genuine circumstances, for instance, lighting conditions, Unintentional facial component changes (blocked faces), Expressions. system Performance is in like manner evaluated the extent that affirmation rate, isolated, false positive rate, time taken for getting ready. False Positive Rates are controlled by considering 60 continuous picture diagrams in Table II. It has been seen that LBP based algorithm gives least false positive rate and great acknowledgment

rate as it accurately separates between the obscure and known faces

LDA can make right segregation between the images just if the separation is given in the database (for instance pictures at different lighting conditions). Division also plays standard speaking in this system appear as the picture edges are gotten when individual goes into the room and face zone is resized. So the face district caught at about 4feet and 7feet gives better results for LBPH and various algorithms independently. For a Training information of 150 pictures planning time is resolved. LBP based figuring requires least time for getting ready where as SVM and Bayes classifiers put aside more effort for planning. In classifiers relationship SVM improves gathering than the rest.

Algorithm 1 Pseudo Code of Proposed System

1. Capture the Student's Image
 2. Apply Viola-Jones algorithm (Face Detection)
 3. Extract the ROI in Rectangular Bounding Box
 4. Convert to gray scale, apply histogram equalization and Resize to 100x100
 - 5.
 - if** Updating Database **then**
 Store in Database
 - else**
 Apply PCA/LDA/LBPH (For feature Extraction)
 Apply Distance Classifier/SVM/Bayesian (for Classification)
 - end if**
 6. Post-processing
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V.RESULTS

In the proposed framework, in the wake of seeing the essences of the students, the names are revived into an exceed expectations sheet. Around the piece of the deal a plan to declare the names of all understudies who are accessible in the class is similarly included. This is executed using content to discourse change. The system is furthermore outfitted with the workplace of sending notice mail to the absentees when that office is empowered. Significant danger to the face acknowledgment systems is spoofing. Subsequently hostile to ridiculing technique like eye squint identifier is fused into the system In order to distinguish the eye flicker the number count of eye disclosure and check of iris area acknowledgment are taken a gander at. In static picture the occasions eye get perceived is proportionate to the events the iris region is recognized or iris district discovery check

would be zero(if person shuts his eyes). This check is enlarged for certain number of frames..

5.1 Graphical User Interface (GUI)

The GUI is created utilizing Winforms Application in Microsoft Visual C # and EmguCV wrapper. The front end created is as appeared in Fig 2.

The system gives the following functions

- Choose the source of input (Webcam/Recorded Video)
- To Update the Database
- Choose the algorithm for preparing and characterization (PCA/LDA/LBPH/PCA+SVM/PCA+Bayesian)
- Announce the Attendees' Names
- Option for Blink Detection

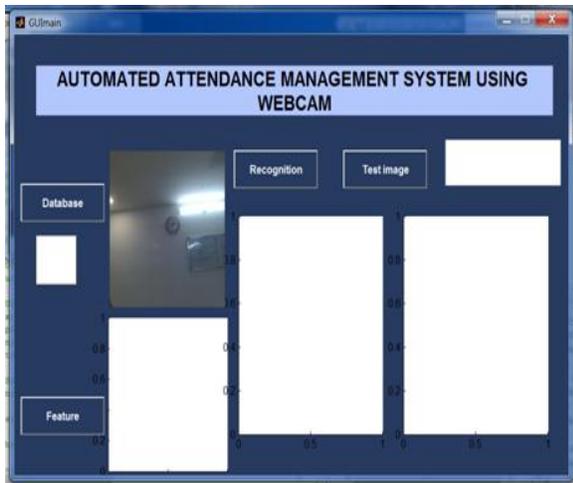


Fig. 2 User Interface of the System Proposed

Excel Sheet and Emails are created when Recognition is finished.

Figure 3 demonstrates the extraction of face area and refreshing to the database after pre-processing. Figure 4 demonstrates the acknowledgment procedure Figure 5 shows Non acknowledgment process. Post-processing step incorporates refreshing the excel sheet with students names who are available as

appeared in Fig 6



Fig. 3 Extraction and Updating Database



Fig.4 Recognizing the faces

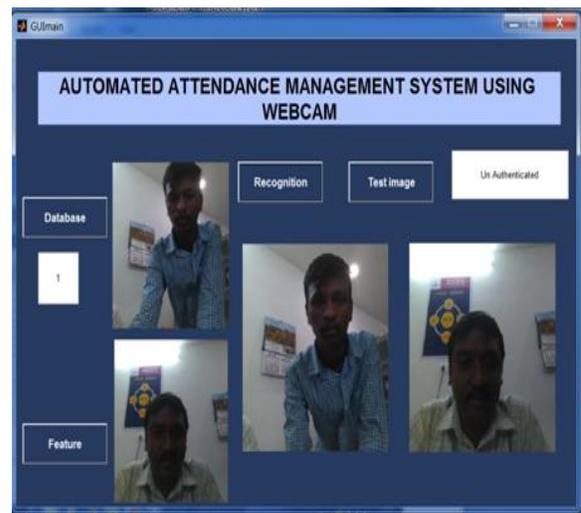


Fig. 5 Non Recognizing the faces

Attendance Sheet		
Roll Number	Student Name	time
1	madhusudhan	9:19AM
2	ravikumar	9:20AM

Fig. 6 Excel sheet of attendance

VII. CONCLUSION

Computerized Attendance Systems dependent on face acknowledgment techniques in this manner turned out to be efficient and verified. This system can similarly be used to recognize an unknown person. Dynamically circumstances LBPH defeats various algorithms with better affirmation rate and low false positive rate. SVM and Bayesian in like manner end up being better classifiers when contrasted with separation classifiers

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