FACE DETECTION AND RECOGNITION FOR AUTOMATICATTENDANCE SYSTEM USING ARTIFICIAL INTELLIGENCE

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Abstract: *In this paper, we propose the plan and utilization of a face detection and recognition framework to consequently recognize students going to an address in a classroom and stamp their attendance by perceiving their faces. This facial biometric framework will consists of an enrolment procedure in which the remarkable features of a people's face will be put away in a database and after that the procedures of distinguishing proof and verification .In these, the recognized face in a picture (got from the camera) will be contrasted and the already stored faces caught at the time of enrolment. In modern times, face recognition has become one of the key aspects of computer vision. There are at least two reasons for this trend; the first is the commercial and law enforcement applications, and the second is the availability of feasible technologies after years of research.In plain words, it is a computer application for automatically identifying a person from a still image or video frame. In this paper we proposed an automated attendance management system.*

Keyword: **Face detection, facial biometrics, Image processing, face recognition, computer vision, trained database, Automatic attendance, Artificial Neural Networks, PCA, Viola-Jones Algorithm, and Generate reports.**

1. INTRODUCTION

Now a day's Image processing which manages extracting helpful data from a computerized image plays a one of a kind part in the approach of innovative advancements. It concentrate around two jobs improvements of pictorial data for human translation processing of picture data for storage, transmission and representation for self-autonomous machine observation. Likewise people have begun to utilize picture capturing machines never as with the approach of advanced devices and circuit TV. Since the application of picture processing is huge, broad work also, research about have been doing in using its potential to and to make new inventive applications.

Facial identification and recognition has been the latest of the application derived from this innovation in, which is a standout amongst the most verification strategies in human face recognition Face is a common multidimensional structure and needs great computational investigation for identification.

Biometrics strategies have been utilized for a similar purpose since quite a while now. In spite of the fact that it is powerful, it is as yet not totally solid for purpose of recognizing a human. Attendances of each and every student are being kept up by each school, college and University. Observational proofs have demonstrated that there is a noteworthy relationship between student attendances and their scholarly performance in. There was additionally a claim expressed that the students who have poor attendance records will by and large connect to poor maintenance.

The manual attendance record framework isn't effective and requires more opportunity to arrange record and to measure the normal attendance of every student consequently there is a necessity of a framework that will take care of the issue of student record design and student normal attendance calculation. One other option to make student attendance framework automatic is given by facial detection and recognition

2. LITERATURE SURVEY

2.1. Iris-Recognition Based Attendance System

Iris is another bio-metric technique that can be utilized for Attendance Frameworks. In the researchers have proposed Daugmans methodology based Iris recognition framework. This framework utilizes iris recognition administration framework that does extracting the picture of iris recognition, extraction, putting away and matching in. Be that as it may, the trouble occurs to lay the transmission lines in the places where the topography is not good. Researchers have proposed a framework in light of continuous face recognition which is dependable, secure and quick which needs change in various lighting conditions

2.2. Ear Detection System for Attendance of Class' Students

Two scientists Visar Shehu and Agni Dika proposed in a framework which presents a attendance marking framework, which incorporates PC vision and ear recognition methodologies into the procedure of attendance management.

2.3. RFID Card Based Attendance System

In PAN Xiang depicted work procedure of a framework as given bellow: At the point when a man needs to enter the entrance control framework, he utilized the RFID card to swiping card by non-touch way in.

2.4. Fingerprint Based Attendance System

In portable fingerprint device has been developed which can be passed among the students to place their finger on the sensor during the lecture time without the instructor's intervention. This system guarantees a fool-proof method for marking the attendance. The problem with this approach is that passing of the device during the lecture time may distract the attention of the students.

3. SYSTEM ANALYSIS

3.1. Existing System

A general approach to protect the data confidentiality is to encrypt the data before outsourcing.

Searchable encryption schemes enable the client to store the encrypted data to the cloud and execute keyword search over cipher text domain. So far, abundant works have been proposed under different threat models to achieve various search functionality, such as single keyword search, similarity search, multi-keyword Boolean search, ranked search, multi-keyword ranked search, etc.

Among them, multi-keyword ranked search achieves more and more attention for its practical applicability. Recently, some dynamic schemes have been proposed to support inserting and deleting operations on document collection. These are significant works as it is highly possible that the data owners need to update their data on the cloud server.

3.2. Disadvantages of Existing System

Huge cost in terms of data usability. For example, the existing techniques on keyword-based information retrieval, which are widely used on the plaintext data, cannot be directly applied on the encrypted data. Downloading all the data from the cloud and decrypt locally is obviously impractical. Existing System methods not practical due to their high computational overhead for both the cloud sever and user.

3.3. Proposed System

This paper proposes a secure tree-based search scheme over the encrypted cloud data, which supports multi-keyword ranked search and dynamic operation on the document

collection. Specifically, the vector space model and the widely-used "term frequency (TF) × inverse document frequency (IDF)" model are combined in the index construction and query generation to provide multi-keyword ranked search. In order to obtain high search efficiency, we construct a tree-based index structure and propose "Greedy Depth-first Search" algorithm based on this index tree.

The secure kNN algorithm is utilized to encrypt the index and query vectors, and meanwhile ensure accurate relevance score calculation between encrypted index and query vectors.

To resist different attacks in different threat models, we construct two secure search schemes: the basic dynamic multi-keyword ranked search (BDMRS) scheme in the known cipher text model, and the enhanced dynamic multi-keyword ranked search (EDMRS) scheme in the known background model.

3.4. Advantages Of Proposed System

Due to the special structure of our tree-based index, the proposed search scheme can flexibly achieve sub linear search time and deal with the deletion and insertion of documents.

We design a searchable encryption scheme that supports both the accurate multi-keyword ranked search and flexible dynamic operation on document collection. Due to the special structure of our tree-based index, the search complexity of the proposed scheme is fundamentally kept to logarithmic. And in practice, the proposed scheme can achieve higher search efficiency by executing our "Greedy Depth-first Search" algorithm. Moreover, parallel search can be flexibly performed to further reduce the time cost of search process.

4. METHODOLOGY

In this proposed framework, the framework is instantiated by the web application. After it triggers then the framework begins processing the picture for which we need to check the attendance. Image Capturing stage is one in which we capture the picture. This is essential stage from which we begin instating our framework. We capture a picture from a camera which is transcendently checked for certain requirements like lightning, separating, thickness, and facial expressions. The captured picture is fearless for our requirements. When it is resolute we ensure it is in jpeg design else it is changed over. We take people various frontal stances with the goal that the precision can be accomplished the greatest extent. This is the training database in which each individual has been ordered in view of names. For the captured picture, from an each object we recognize just frontal faces from viola-Jones methodology in which identifies just the frontal face posture of an each person from the captured picture. This identifies just faces and removes each different part since we are investigating the features of just faces.

These recognized faces are put away in the test database for further enquiry. Features are extricated in this extraction stage. The identified bounding boxes are additionally questioned to search for feature extraction and the removed features are stored in matrix

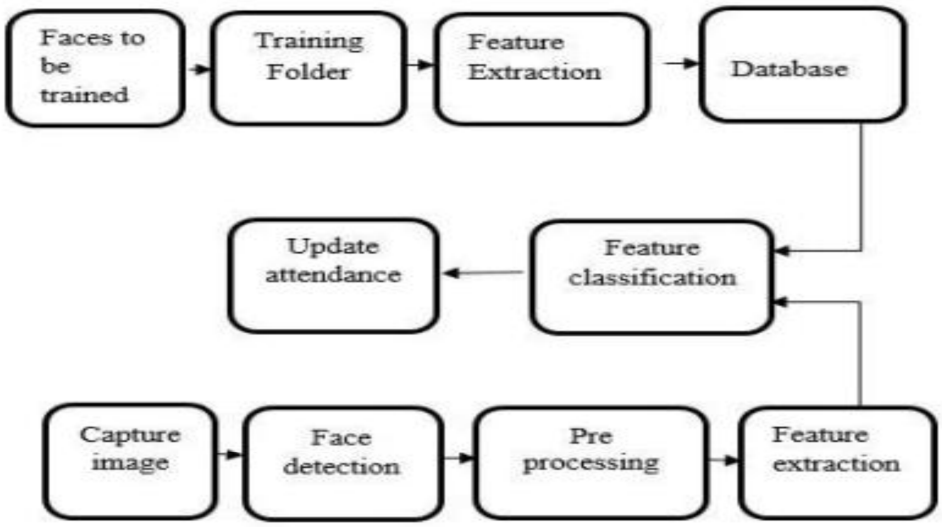

Fig: 4.1. System Overview

4.1. Feature Extraction

In the real time object is detected by using various technique but here feature extraction will be done by using pca algorithm for each recognized stage this feature extraction is finished. Features we look here are Shape, Edge Skin Color and face geometry. Face is perceived once we finished extracting features in. The feature which is as of now prepared with each individual is compared and the recognized faces include furthermore, if the two features matched then it is recognized.

When, it detects it will update sin the student attendance database. Once, the procedure is finished the testing pictures gets erased since, we are attempting to plan it for both the accuracy and in addition productivity co-effective After the face detection step, student face patches are extracted from pictures. Specifically utilizing these patches for face recognition have a few weaknesses; in the first place, each patch for the most part contains more than 1000 pixels, which are too vast to manufacture a strongest recognition framework. Second, face patches might be taken from various camera alignments, with various face feelings, illuminations, and may experience the ill effects of occlusion and clutter in.

To beat these disadvantages, feature extractions are performed to do data packing, measurement reduction, remarkable quality extraction, and noise cleaning.

After this progression, a face patch is generally changed into a vector with fixed measurement or an arrangement of fiducially focuses and their relating locations. In a few references, feature extraction is either incorporated into face detection or face recognition.

4.2. Approach

We have examined different techniques for automatic attendance framework in the past area. Every one of the strategy has a few issues, for example, illumination issue, head posture issue, various face detection, and so on. So this paper proposes another strategy to beat every one of these issues. This technique utilizes Viola and Jones methodology for face detection as it is an effective face detection strategy. This technique can likewise detect various faces and can be effectively utilized as a part of a classroom.

At that point the detected faces are cropped from the captured picture and afterward verified with face database. For this, a proficient Eigen Face algorithm in is utilized which can overcome the illumination and head posture issue. Also, the recognition rate can be expanded utilizing this strategy.

4.3. Principal Component Analysis (PCA)

PCA was invented by Karl Pearson in 1901. It involves the mathematical method to transforms an amount of probably interrelated variables into a numeral of unorganized variables is called the principal components, related to original variables by an orthogonal transformation. The transformation can be defined as that the first principal component has as high variance as it is possible and for every succeeding component thus has the highest variance conceivable under the imperative that it be orthogonal to the former components in.

Steps Used in PCA Algorithm

Step1: Acquire preparing set of 'N' number of pictures at the first stage. In this technique the pictures are of 92*112 pixels each.

Step2: Calculation of the Eigen face from the "N" preparing set pictures keeping just couple of M pictures that is relate to that of the most highest Eigen values. The M pictures indicate the "face space". At the point when new faces experienced, the "Eigen faces" can be recalculated in like manner.

Step3: The relating distribution of the "M" dimensional weight space for each known individual is calculated by representing their particular face pictures onto "face space".

Step 4: Compute set of the weights anticipating the information picture or info picture to M "Eigen faces".

Step5: Determine if the given picture is face picture or not by checking to the closeness of given picture or picture to "face space".

Step 6: If the picture is sufficiently close, at that point characterize the weight design as either an unknown or as a known individual in view of measured Euclidean separation.

Step7: If the picture is adequately sufficiently close at that point refer to the recognition is effective and give appropriate data about recognized face from the database which hold information of faces.

4.4. Face Recognition Algorithm

We have used Principal Component Analysis algorithm in our work. Principal component analysis (PCA) is a statistical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components. The number of principal components is less than or equal to the number of original variables. This transformation is defined in such a way that the first principal component has the largest possible variance (that is, accounts for as much of the variability in the data as possible), and each succeeding component in turn has the highest variance possible under the constraint that it is orthogonal to the preceding components. The resulting vectors are an uncorrelated orthogonal basis set. PCA is sensitive to the relative scaling of the original variables.PCA is mostly used as a tool in exploratory data analysis and for making predictive models.

PCA can be done by Eigen value decomposition of a data covariance (or correlation) matrix or singular value decomposition of a data matrix, usually after mean centering (and normalizing or using Z-scores) the data matrix for each attribute. The results of a PCA are usually discussed in terms of component scores, sometimes called factor scores (the transformed variable values corresponding to a particular data point), and loadings (the weight by which each standardized original variable should be multiplied to get the component score).

PCA is mathematically defined as an orthogonal linear transformation that transforms the data to a new coordinate system such that the greatest variance by some projection of the data comes to lie on the first coordinate (called the first principal component), the second greatest variance on the second coordinate, and so on.

4.5. Computing PCA using the covariance method

The goal is to transform a given data set X of dimension p to an alternative data set Y of smaller dimension L. Equivalently; we are seeking to find the matrix Y, where Y is the Kosambi-Karhunen–Loève transform (KLT) of matrix X: Y=KLT(X)

Step 1: Organize the data set
Step 2: Calculate the empirical mean
Step 3: Calculate the deviations from the mean
Step 4: Find the covariance matrix
Step 5: Find the eigenvectors and eigenvalues of the covariance matrix
Step 6: Rearrange the eigenvectors and eigenvalues
Step 7: Compute the cumulative energy content for each eigenvector
Step 8: Select a subset of the eigenvectors as basis vectors
Step 9: Convert the source data to z-scores (optional)
Step 10: Project the z-scores of the data onto the new basis.

FLOW CHART OF ALGORITHM

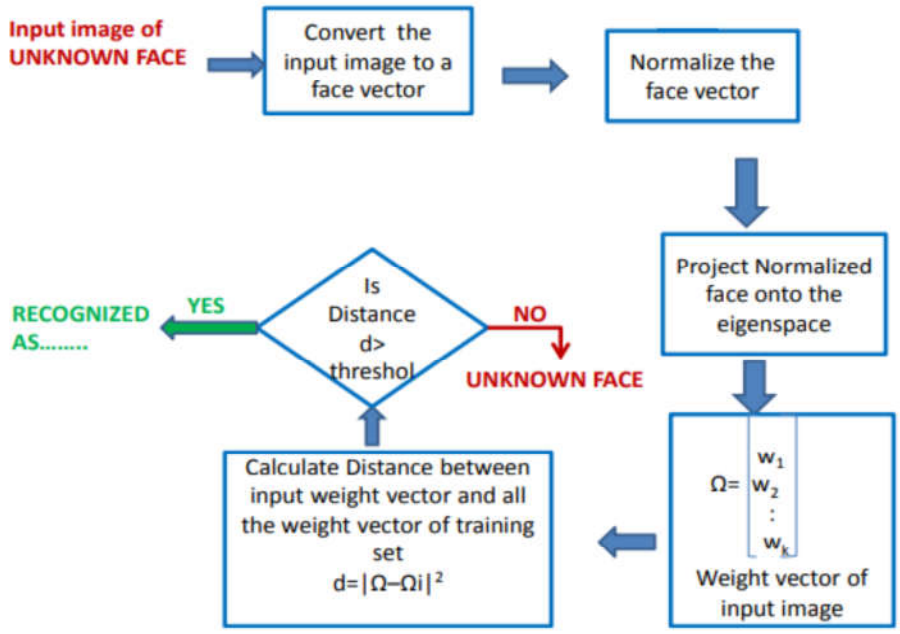

Fig: 4.2. Flow Chart Of Algorithm

4.6. Dataset Collection

In this section we propose a multi-stage strategy to effectively collect a large face dataset containing hundred of example images for thousands of unique identities. The different stages of this process and corresponding statistics are summarized in. Individual stages are discussed in detail in the following paragraphs.

Stage1. Bootstrapping and filtering a list of candidate identity names. The first stage in building the dataset is to obtain a list of names of candidate identities for obtaining faces. The idea is to focus on celebrities and public figures, such as actors or politicians, so that a sufficient number of distinct images are likely to be found on the web, and also to avoid any privacy issue in downloading their images.

An initial list of public figures is obtained by extracting males and females, ranked by popularity, from the Internet Movie Data Base (IMDB) celebrity list. This list, which contains mostly actors, is intersected with all the people in the Freebase knowledge graph, which has information on about 500K different identities, resulting in a ranked list of 2.5 males and 2.5K females. This forms a candidate list of 5K names which are known to be popular (from IMDB), and for which we have attribute information such as ethnicity, age, kinship etc. (from the knowledge graph). The total of 5K images was chosen to make the subsequent annotation process manageable for a small annotator team.

The candidate list is then filtered to remove identities for which there are not enough distinct images, and to eliminate any overlap with standard benchmark datasets. To these end 200 images for each of the 5K names are downloaded using Google Image Search. The 200 images are then presented to human annotators (sequentially in four groups of 50) to determine which identities result in sufficient image purity. Specifically, annotators are asked to retain an identity only if the corresponding set of 200 images is roughly 90% pure. The lack of purity could be due to homonymy or image scarcity. This filtering step reduces then candidate list to 3,250 identities. Next, any names appearing in the LFW and YTF datasets are removed in order to make it possible to train on the new dataset and still evaluate fairly on those benchmarks. In this manner, a final list of 2,622 celebrity names is obtained.

Stage2. Collecting more images for each identity. Each of the 2,622 celebrity names is queried in both Google and Bing Image Search, and then again after appending the keyword “actor” to the names. This results in four queries per name and 500 results for each, obtaining 2,000 images for each identity.

Stage3. Improving purity with a filter. The aim of this stage is to remove any erroneous faces in each set automatically using a classifier. To achieve this the top 50 images (based on Google search rank in the downloaded set) for each identity are used as positive training samples, and the top 50 images of all other identities are used as negative training samples. A one-Vs-rest linear SVM is trained for each identity using the Fisher Vector Faces descriptor. The linear SVM for each identity is then used to rank the 2,000 downloaded images for that identity, and the top 1,000 are retained (the threshold number of 1,000 was chosen to favors high precision in the positive predictions).

Stage4. Near duplicate removal Exact duplicate images arising from the same image being found by two different search engines, or by copies of the same image being found at two different Internet locations, are removed. Near duplicates (e.g. images differing only in colour balance, or with text superimposed) are also removed. This is done by computing the VLAD descriptor for each image, clustering such descriptors within the 1,000 images for each identity using a very tight threshold, and retaining a single element per cluster.

Stage5. Final manual filtering. At this point there are 2,622 identities and up to 1,000images per identity. The aim of this final stage is to increase the purity (precision) of the data using human annotations. However, in order to make the annotation task less burdensome, and hence avoid high annotation costs, annotators are aided by using automatic ranking once more. This time, however, a multi-way CNN is trained to discriminate between the 2,622 face identities using the Alex Net architecture of, and then

the softmax scores are used to rank images within each identity set by decreasing likelihood of being inliers. In order to accelerate the work of the annotators, the ranked images of each identity are displayed in blocks of 200 and annotators are asked to validate blocks as a whole. In particular, a block is declared good if approximate purity is greater than 95%. The final number of good images is 982,803, of which approximately 95% are frontal and 5% profile.

Discussion Overall, this combination of using Internet search engines, filtering data using existing face recognition methods, and limited manual duration is able to produce an accurate large-scale dataset of faces labeled with their identities. The human annotation cost is quite small – the total amount of manual effort involved is only around 14 days, and only four days up to stage 4.

A number of design choices have been made in the process above. Here we suggest some alternatives and extensions. The Freebase source can be replaced by other similar sources such as DB Pedia (Structured Wiki Pedia) and Google Knowledge Graph. In fact, Freebase will be shut down and replaced by Google Knowledge Graph very soon. On the image collection front, additional images can be collected from sources like Wikimedia Commons, IMDB and also from search engines like Baidu and Yandex. The removal of identities overlapping with LFW and YTF in stage 1 could be removed in order to increase the number of people available for the subsequent stages. The order of the stages could be changed to remove near duplicates before stage 2. In terms of extensions, the first stage of collection can be automated by looking at the distribution of pair wise distances between the downloaded images. An image class with high purity should exhibit a fairly unimodel distribution.

4.7. Network architecture and training

This section describes the CNNs used in our experiments and their training. Inspired by, the networks are “very deep”, in the sense that they comprise a long sequence of convolution layers. Such CNNs have recently achieved state-of-the-art performance in some of the tasks of the Image Net ILSVRC 2014 challenge, as well as in many other tasks.

4.8. Learning a face classifier

Initially, the deep architectures f are bootstrapped by considering the problem of recognizing N = 2; 622 unique individuals, setup as a N-ways classification problem. The CNN associates to each training image `t ; t = 1; : : : ;T a score vector xt = Wf(`t)+b 2 RN by means of a final fully-connected layer containing N linear predictors W 2RN_D; b 2RN, one per identity. These scores are compared to the ground-truth class identity ct 2 f1;::; Ng by computing the empirical softmax log-loss E(f)=□åt log xt = f(`t) 2 RD, and ec denotes the one-hot vector of class c.

After learning, the classifier layer (W;b) can be removed and the score vectors f(`t) can be used for face identity verification using the Euclidean distance to compare them. However, the scores can be significantly improved by tuning them for verification in Euclidean space using a “triplet loss” training scheme, illustrated in the next section,

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4.9. Learning a face embedding using a triplet loss

Triplet-loss training aims at learning score vectors that perform well in the final application, i.e. identity verification by comparing face descriptors in Euclidean space. This is similar in spirit to "metric learning", and, like many metric learning approaches, is used to learn a projection that is at the same time distinctive and compact, achieving dimensionality reduction at the same time.

Our triplet-loss training scheme is similar in spirit to that of. The output f(`t ) 2 RD of the CNN, pre-trained as explained in Section , is l2-normalised and projected to a L_D dimensional space using an affine projection xt =W0f(`t)=kf(`t)k2, W0 2 RL_D. While this formula is similar to the linear predictor learned above, there are two key differences.

The first one is that L 6=D is not equal to the number of class identities, but it is the (arbitrary) size of the descriptor embedding (we set L = 1; 024). The second one is that the projection W0 is trained to minimize the empirical triplet loss.

Note that, differently from the previous section, there is no bias being learned here as the differences in would cancel it. Here a _ 0 is a fixed scalar representing a learning margin and T is a collection of training triplets. A triplet (a; p;n) contains an anchor face image a as well as a positive p 6= a and negative n examples of the anchor's identity. The projectionW0 is learned on target datasets such as LFW and YTF honoring their guidelines. The construction of the triplet training T set is discussed in below Section.

4.10. Training

Learning the N-way face classifier follows the steps of with the modifications suggested by. The goal is to find the parameters of the network that minimize the average prediction log-loss after the softmax layer.

We describe the procedure for the CNN A configuration first, and then the variants for the B and D configurations. Optimization is by stochastic gradient descent using mini-batches of 64 samples and momentum coefficient of 0.9. The model is regularized using dropout and weight decay; the coefficient of the latter was set to 10.4, whereas dropout was applied after the two FC layers with a rate of 0.5. The learning rate was initially set to 10.2 and then decreased by factor of 10 when the validation set accuracy stopped increasing. Overall, the model was trained using three decreasing learning rates.

The weights of the filters in the CNN were initialized by random sampling from a Gaussian distribution with zero mean and 10.2 standard deviation. Biases were initialized to zero. The training images were rescaled such that the smaller of width and height was equal to 256. During training, the network is fed with random 224_224 pixel patches cropped from these images (where crops change every time an image is sampled). The data was further augmented by flipping the image left to right with 50% probability; however, we did not perform any colour channel augmentation as described in.

The CNN configuration A is trained from scratch, whereas configurations B and D are trained by starting from the trained A. This is obtained by appending additional fully connected layers to A, randomly initialised, and then training the latter as well as fine-tuning (Train with a lower learning rate) the network again.

For learning the embeddings using triplet loss, the network is frozen except the last fully-connect layer implementing the discriminative projection. This layer is then learnt for 10 epochs using SGD with a fixed learning rate of 0:25. An epoch here contains all the possible positive pairs (a; p), where image is considered the anchor and p its paired positive example. Choosing good triplets is crucial and should strike a balance between selecting informative (i.e. challenging) examples and swamping training with examples that are too hard. This is achieve by extending each pair (a; p) to a triplet (a; p;n) by sampling the image n at random, but only between the ones that violate the triplet loss margin. The latter is a form of hard-negative mining, but it is not as aggressive (and much

cheaper) than choosing the maximally violating example, as often done in structured output learning.

At test time, the embedded descriptors W0f (`t) are compared in Euclidean distance for the purpose of face verification. In verification the goal is to tell whether two face images

4.11. Module Description

In this proposed framework, the framework is instantiated by the web application .After it triggers then the framework begins processing the picture for which we need to check the attendance. Image Capturing stage is one in which we capture the picture in. This is essential stage from which we begin instating our framework.

We capture a picture from a camera which is transcendently checked for certain requirements like lightning, separating, thickness, and facial expressions. The captured picture is fearless for our requirements. When it is resolute we ensure it is either in png or jpeg design else it is changed over.

We take people various frontal stances with the goal that the precision can be accomplished the greatest extent. This is the training database in which each individual has been ordered in view of names. For the captured picture, from an each object we recognize just frontal faces from viola-Jones methodology in which identifies just the frontal face posture of an each person from the captured picture. This identifies just faces and removes each different part since we are investigating the features of just faces. These recognized faces are put away in the test database for further enquiry. Features are extricated in this extraction stage. The identified bounding boxes are additionally questioned to search for feature extraction and the removed features are stored in matrix.

1.Administrator: An administration has complete access over the entire
software system. They must have valid username and password to log in to the system. After providing the valid log in info, the admin can view desired student/faculty accounts, their details and attendance history. Administrator can update the academic calendar in the database and can also add/delete a user from the system.

2. Faculty: Like the administrators, faculty too must have a valid username cum password to log in to the online attendance management system. The valid faculty members can view the desired accounts, details of students as well as details of the faculty.

3. Student: Student needs valid username and password to log in to the system. Like in admin and faculty modules, if a wrong log in info is provided, the system asks for valid username and password again. With this module, students can view their details and the reports generated by the administrator about their attendance.

4. Face ID: students need to upload the image after successful registration on to the attendance system with this module student details and the face recognition would be created and the report generated by the administrator about the attendance.

5. ARCHITECTURE AND DESIGN

5.1. Feature Selection And Extraction

Throughout the past few decades there have been many face detection techniques proposed and implemented. Some of the common methods described by the researchers of the respective fields are:

5.1.1. Principal Component Analysis

In high-dimensional data, this method is designed to model linear variation. Its goal is to find a set of mutually orthogonal basis functions that capture the directions of

maximum variance in the data and for which the coefficients are pair wise decorrelated. For linearly embedded manifolds, PCA is guaranteed to discover the dimensionality of the manifold and produces a compact representation.

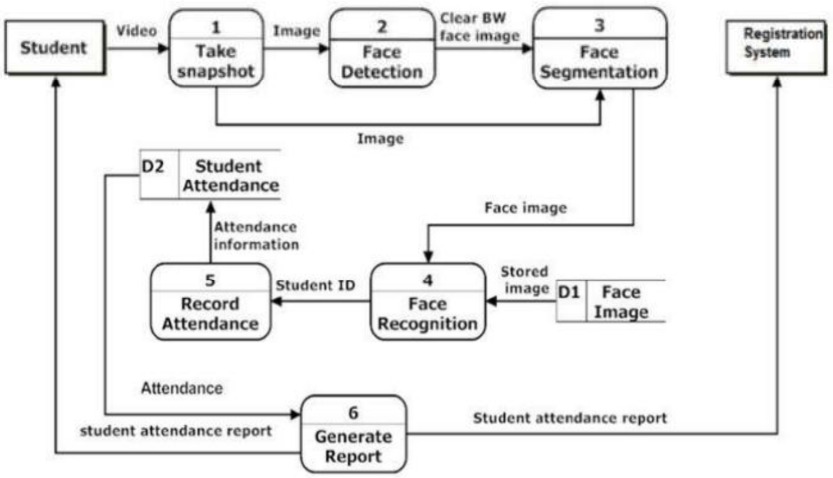

Fig: 5.1. System Architecture

PCA was used to describe face images in terms of a set of basic functions, or eigenfaces. Eigen faces was introduced early on as powerful use of principal components analysis (PCA) to solve problems in face recognition and detection. PCA is an unsupervised technique, so the method does not rely on class information. In our implementation of eigenfaces, we use the nearest neighbour (NN) approach to classify our test vectors using the Euclidean distance. Multilinear Principal Components Analysis One extension of PCA is that of applying PCA to tensors or multilinear arrays which results in a method known as multilinear principal components analysis (MPCA). Since a face image is most naturally a multilinear array, meaning that there are two dimensions describing the location of each pixel in a face image, the idea is to determine a multilinear projection for the image, instead of forming a one-dimensional (1D) vector from the face image and finding a linear projection for the vector. It is thought that the multilinear projection will better capture the correlation between neighborhood pixels that is otherwise lost in forming a 1D vector from the image.

5.1.2. Linear Discriminant Analysis

Fisherfaces is the direct use of (Fisher) linear discriminant analysis (LDA) to face recognition. LDA searches for the projection axes on which the data points of different classes are far from each other while requiring data points of the same class to be close to each other.

Unlike PCA which encodes information in an orthogonal linear space, LDA encodes discriminating information in a linearly separable space using bases that are not necessarily orthogonal. It is generally believed that algorithms based on LDA are superior to those based on PCA. However, other work such as showed that, when the training data set is small, PCA can outperform LDA, and also that PCA is less sensitive to different training data sets. When applying PCA to a set of face images, we are finding a set of basis vectors using lower order statistics of the relationships between the pixels. Specifically, we maximize the variance between pixels to separate linear dependencies between pixels. MPCA is a generalization of PCA in that it tries to identify high-order statistical relationships between pixels to form a better set of basis vectors where the pixels are treated as random variables and the face images as outcomes. In a similar

fashion to PCA and LDA, once the new basis vectors are found, the training and test data are projected into the subspace and a method such as NN is used for classification.

5.1.3.Neural Networks

To model our way of recognizing faces is imitated somewhat by employing neural network. This is accomplished with the aim of developing detection systems that incorporates artificial intelligence for the sake of coming up with a system that is intelligent. The use of neural networks for face recognition has been shown by and we can see the suggestion of a semi-supervised learning method that uses support vector machines for face recognition. There have been many efforts in which in addition to the common techniques neural networks were implemented. For example in a system was proposed that uses a combination of Eigen faces and neural network. First the dimensionality of face image is reduced by the Principal component analysis (PCA) and later the recognition is done by the Back propagation Neural Network (BPNN).

6. RESULS

The results of face recognition system output screen shots are as given below.

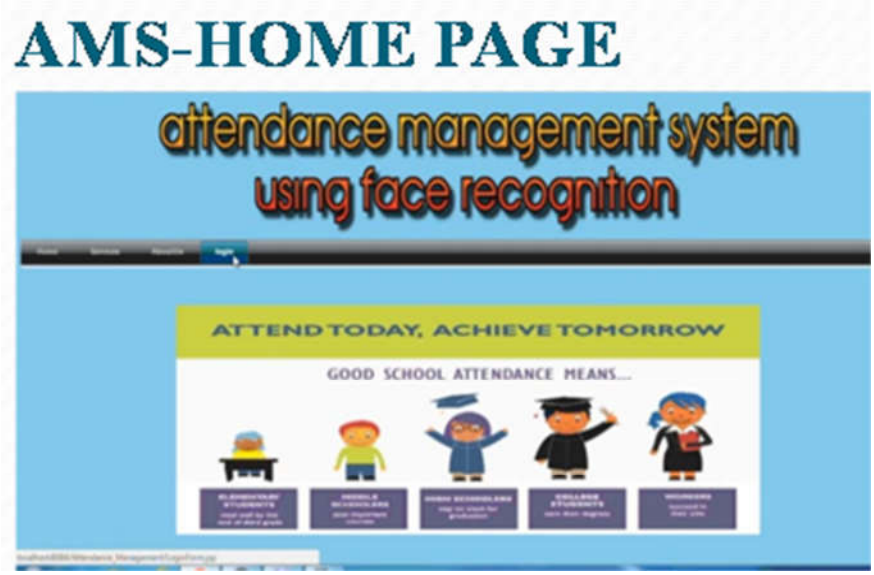

Fig: **6.1. AMS-HomePage**



Fig: 6.2. New Student Registration Form

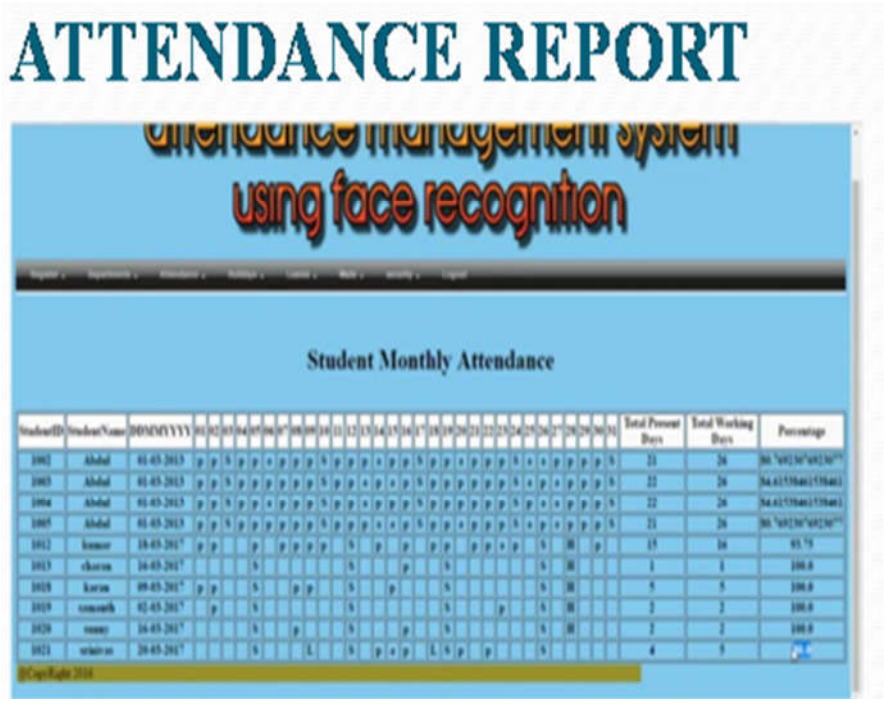

Fig: 6.3. Attendance Report

7. CONCLUSION

This task concentrates on building up a computerized attendance system. It reduces time and effort, particularly on the off chance that it is an address with maximum number of students. This attendance framework demonstrates the utilization of facial recognition procedure for the reason for student attendance and for the further procedure this record of student can be utilized as a part of exam related issues. It is difficult to identify faces having similar facial features. The framework can be reached out to react to the nearness of newcomers in the classrooms. Additionally, intends to check attendance without the mediation of teacher in a classroom i.e. consequently marking attendance at the start of consistently can be implemented. It can be reached out to video surveillance to recognize fakes at huge population areas, for example, transport stands, theatre, railroad stations where in by face recognition procedures, the identity of the offenders can be found.

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