**Attendance System Using face recognition**

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**ABSTRACT:**

In this project, we will design an attendance system using facial recognition. The software recognizes and recognizes student images and creates a log file of class attendance. It also records the date and time of student attendance. In this way, you can replace the normal paperwork or roll-call system that is commonly used these days. In this project, we will use various tools and algorithms to make the software work. Because face recognition is an extension technology, it also replaces the finger biometric system. In this software, a process flow is performed such that the camera or image face function is stored in memory. This algorithm handles data from the image and analyses the learned pattern and compares them to filter the rest.

**INTRODUCTION:**

In this software, we will use a facial recognition algorithm to automatically attend the course. Student attendance will be recorded with name, student ID, date, time and some other personal information. In this system, we will take pictures of different students in the database to recognize faces and then conduct attendance accordingly. This system will save a lot of time that is often wasted in the form of attendance and other old methods.

One of the most popular neural network architectures today is Alex Net. It uses lakhs of images and then make it into objects in a categorized way so that the face can be detected. The face of a person is taken as an input, and it is labelled with a number. The network input size is 227,227 3 RGB images.

As the current attendance taking process are so time consuming and it is very difficult to maintain the record of the attendance so, in this system we will be creating attendance system using facial recognition technique. There is also the possibility of attending by proxy. Therefore, the demand for this system is increasing day by day. Database development, face detection, face recognition and attendance update are the four steps of this system. Photos of the children in the class were used to create the database. The Harassed classifier and the Local Binary Patterns technique were used to recognize and classify the faces, respectively. Faces are recognized and verified from class webcast images. At the end of the session, the attendance score will be transferred to the appropriate department.

• While taking classes, it takes less time.

• Using this system, the process will be completely digital.

• Improve the use of technology in different areas.

• Good lighting conditions will be required to use the software.

• An Excel sheet will be formed for attendance.

• Camera: Used to record live video of students for attendance.

• Vision acquisition: This software will visualize the image of a person for programming.

• Grayscale Image: This process is used to convert an image from a 16/32-bit image to an 8 bit image. This is a very important task for our algorithm to work correctly.

• Model mining: The converted image will be recognized and linked to the database to perform the next task.

• Search the corresponding database: if

• images are linked to the database, then the presence will be highlighted.

• Update attendance sheet: if there is a match in the database, the attendance record will be marked with the date and time

• We have proposed a model for automatic time attendance system. In this project we will be focusing on facial recognition technique to identify and comparing the data with existing dataset. Guests must initially register their personal information along with their unique iris pattern.

The goal of this project is to facilitate attendance and reduce time. Using an ID card or manually is ineffective and ineffective call support and record it on the sheet. The number of faces in the class will be detected by this system, which will also recognize them from the stored database. With facial recognition and detection technology in place, it will be simple to determine if a student is engaged.

**RELATED WORK:**

In this project the captured image of the student will be converted into the system readable image, or 8bit image and that image will be compared from the database by using face detection and recognition. In this the front face will provide the accuracy of 80 to 90 percent and the function will be proceeded further. The flow of image starts with dividing and calculating the histogram of each block and combining all the blocks in a single histogram. This histogram will provide us with some value which will be compared with the values of captured image. If the percentage of captured image get matched up to 7090 percent, then the attendance will be marked and updated in the excel sheet with date and time. However, the match will be below 70% and show an error. For this software, we will use geometric feature method, cv, neural network, subspace analysis method, support vector machine (SVM) technique to develop mild recognition system face.

Dataset foundation:

A webcam is used to collect images of students. Several photos of a student will be taken from a variety of angles and movements. Pre-processing is applied to these images. Crop images for objects of interest, to be used in the identification process. The cropped images are then resized at a certain pixel point. These photos will then be converted from RGB to grayscale. The photos will then be stored in a folder with the names of the participants. We will be collecting a set of images by using a camera having good pixel and then we will be providing that images into different classes having different layers all the classes will represent different gender with different number of people.

FACE DFETECTION:

Haar Cascade classifier with OpenCV is used for face recognition in this example. Before it can be used to detect faces, the Haar Cascade algorithm must be taught to recognized human faces. The proposed technique is the term for this process. OpenCV's DE Multiscale package is used here. To build a rectangle around the faces of an image, it is necessary. It considers three parameters: scale Factor, neighbours and man-size. The scale Factor parameter specifies how much to shrink the image in each aspect ratio. The minimum number of neighbours that each candidate rectangle appears to have is specified by neighbours. Higher values ​​generally identify fewer faces while detecting better image quality. The minimum object size is specified by min size.

Face Recognition:

The three steps of the face recognition include collecting training data, training the face recognizer, and producing predictions. Training data will be collected from the pictures in the collection. The integer identifier of the student to whom they belong will be provided to him. These photographs are then subjected to face recognition. The face recognizer used in this system is the Local Binary Pattern Histogram. The complete set of local binary samples (LBPs) of the originally constructed face. The data is converted into the histogram having all decimal values for construction. Each frame in the training data will have its own graph at the end. During the recognition process, the histogram of the face to be recognized is formed and the best model from the data set is returned.

Attendance Updating:

As a person is detected in the camera frame it will take his picture and compare with the existing images of the data set if the data will be matched up to 80% then it will be marked present in the excel sheet.

APPLICATIONS:

a. A large use in the institute attendance system, and for several attendances of various classes. Attendance will be timed, and human mistakes will be minimized.

b. Computer vision is widely used in the fields of communication, biomedicine, and automatic product inspection.

FLOW CHART:

It will explain the flow of information throughout the attendance process-

***Diagram

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Proposed Methodology:

In this project we have approached different methodologies like collection of the data, rearrangement of data, data enhancement, CNN training and validation and the system testing.

Data Collection:

The dataset will be assembly of lots of images captured using a camera having good pixel quality, then this data will be uploaded further process having different classes and different layers consisting of different types of images. The format of the images will be jpg and the size variation will be 1 to 10 mb per image because of the variation in the size we have to reduce the size of every image to a particular one.

Data Augmentation

This is a technique to modify existing data into a new arrange data format. In different machine learning models this technique helps to minimize the overfitting of the data. In machine learning model data enhancement comes in the form of geometric transforms, flips, colour distortions, cropping, rotations, noise insertion, and random deletions to improve images. The captured image from different sides or corner of a frame will be imported and turned into a well-designed network so that it can be compared with the existing data after this a random rotation of the image will be performed so that the scattering of the image will be easier.

Tuning of pretrained network:

In this project we will be training our data with the neural network we will be using squeeze net, Alex net and google net. During the training of the model, we will be using CNN of squeeze net for the distribution and communication between the servers because of its limited hardware, memory we also will be using Alex net to convert the learned functions into a trained image because of this the problem of over fitting will be solved. We will also check on the probabilities of net specification and forming different options to establish many trails and changes. While it will avoid overfitting of the data by getting it out of worst local minimum, there will be a minimum requirement of variation requested for convergence. The google net architecture starer module will solve the problem of large network data set because of its low error rate. We will be using a network parameter to train the model as a 2D convolutional layer and classifier output class. In this we changed the original size into 1\*1 and the number of filters to 10 for the different classes of the data base. For output layer we modified the label to adapt it with data set.

Training

While training the model we have to change the basic parameters of the architecture and we have to follow some constraints like the rate of learning, time taken to train a model, number of functions and the authentication of the program. At first the ratio of training model to become a stable model is very less so it is not considered optimal continuity. There fore we have chosen that the initial learning rate will be 0.003, the frequency rate of the validation should be 12, and number of processes should be reduced so that there will be low risk pf failure of this model. Strictly speaking, the learning cycle of the training model will depend upon the dataset, batch size. For this there will be a need of minimum 8gb ram and CPU running speed of 2.0 GHz. Because the higher the number of epochs the more accurate the model will perform so 75% of our data will be used for training and rest of the data will be used as validation.

Future Scope

With the help of this model the human effort will be reduced, and the work will become more efficient and precise. Due to its high accuracy this model can also be implemented in government and private officers for tracking down the check in and check out time. It is also very useful in security aspects to prevent unauthorised entry in the workspace of companies and big authorities. This system can also be used to identify the criminals by the police force. According to the current scenarios of security breaches this system can be very useful in future and for that purpose we have to build this model very strongly and provide it with the difference deep learning techniques. In this way this model can be used by number of entities like schools, Universities, companies, security cells etc. in their own different manners.

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Results and Discussion

Squeeze Net's training required a total of 29 millennia, with 14 iterations every century, for the network to properly train and validate the data. It attained an accuracy result of 97.34 percent after 360 iterations. The workout lasted 26 minutes and 52 seconds. Moreover, the verification frequency is iterated ten times to guarantee that system is well-trained but not overfitted by data. The Google Net training requires a maximum of 30 epochs, with 14 repetitions per epoch, to train and verify the information extremely successfully. He achieved a verification reliability of 92.4 percent after 360 iterations. The training set will require 41 minute to complete the training cycle. Furthermore, conformation will be made in 20 sec after the cycle completion Alex net will be used to train the total cycle up to 50 times with the rate of 11 iteration per hour for the better transport of data authentication. After the 700 iteration it will achieve 99% authentication accuracy. In comparison to two preceding networks, the networks lost 78 minutes to complete the training, resulting in a protracted treatment duration. In addition, a 10-eretal method has been used to guarantee that the system is well-trained, although there is no data. We utilised a machine with a one-of-a-kind processor running at 2 Ghz and 8.00 GB of RAM. As depicted in the illustration. For all three networks, we utilised the same starting academic rate, unique iterations, and unique CPUs, although the number of various periods for each network was the same. As can be seen, Alex Net is the greatest networks in term of validation accuracy, but because to the large number of parameters, it takes the longest to train. Compress Net is the best option, with a 98.33 percent success rate with a sets minimum duration of 28 minutes 54 seconds, precision may be achieved. The accuracy of Google Net is the lowest of the three systems.

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Conclusion

In this research paper we have discussed about the attendance system using face recognition technique

With the help deep learning and transfer learning. In this model we use pretrained integrated neural network system to train our model. In this way we get a high-performance training set with high accuracy. First, we provide the model with the different set of images and then scale them up to an equal mark. While using the neural network technique we will compare captured images with the pre-existing data and by using the python codes we will be able to make a data set of that recognized images into excel sheet. In this way our model will be 97% accurate. In case of foul entry, it will throw an error and excel sheet will not be maintained for that kind of data. It is interesting approach in attendance systems so that there will be less human effort and accuracy.

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