

Face Recognition based Smart Automatic Attendance System using OpenCV LBP

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Abstract - A Human face Human face stands a critical biometric object in picture and video information bases of observation frameworks. Attendance of students during a huge study hall is difficult to be dealt with by the ordinary framework, since the time has come devouring and includes a high likelihood of mistake during the technique for contributing information into the pc. This is frequently mechanized participation checking framework utilizing face recognition strategy. The participation of the researcher was refreshed to the Excel sheet after understudy's face has been perceived. In this paper, GUI based programmed Face identification and recognition framework is created during this undertaking. It is frequently utilized as access framework by enrolling the staff or students of an organization with their faces, and later it'll recognize individuals by catching their pictures with faces, when they are entering or leaving the class room. The framework is carried out on a work area with a Graphical User Interface; at first it distinguishes the appearances inside the pictures that are gotten from a web camera. Every one of the devices and working, won't to stand in this method like OpenCV, Python, are open source tools. This continuous GUI based face recognition and identification framework is created utilizing Open source tool like as OpenCV with python.

Key Words: Open CV, Python, Face recognition, Human face Web camera, Graphical User Interface, Student,

1. INTRODUCTION

Face Recognition attendance system been a genuine subject of studies inside the previous few decades. It's something that comes normal to people. Our system does complex examination of faces to store valuable data about them, which comes helpful when attempting to recognize a face by just picking the match Dakin and Watt in 2009. Researchers actually don't completely see how the cerebrum capacities Marcus in 2012. Notwithstanding, that didn't prevent researchers from taking a few undertakings that the mind can do and look at to intrude on them directly down to straightforward strides to have an overall comprehension of that assignment. Personal Computers are getting as a significant a piece of our life like work area, telephones,

glasses and bunches of additional; their errand is to shape life simpler. Since PCs are filling significantly as far as execution, showing a PC the best approach to do cerebrum like errands become more doable than any other time. The computerized recognizable proof of a person by his/her appearances from an image or video transfer has wide application is on cell phones, the use for it are normal broadened significantly. It are normal companies with different highlights of cell phones like Geo area or perhaps the direction of the device.

Face recognition concept focused inside the mid-1970s. In any case, it's fast improvement began inside the 1990s, after the establishment of latest developments inside the field of picture taking care of and artificial intelligence. Face affirmation may be a program that is wont to perceive faces normally and check the personality of an individual from a high level picture or a video. All things considered, the face affirmation issue involves two stages. In any case, recognizing a face, for instance finding a face in a photograph situation paying little heed to who the individual is. Second, perceiving who the individual is inside the edge. By differentiating the features of the perceived face to the image faces data base the structure can recognize the person inside the image. To be set up to stamp the person inside the image, the machine should be arranged as of now. The readiness steps incorporate perceiving a face by then use some image taking care of procedures to protect the clearness of the appearances for the machine. By then, applying one among many planning estimations to show the system who that person.

1.1 Problem Statement

As shown by the past interest the participation of the attendance system, the accuracy of the information accumulated is that the best issue. This is often considering the way that the cooperation won't be recorded eventually the principle individual, in another word, the investment of a specific individual are routinely taken by a pariah without the conviction of the foundation which dismisses the accuracy of the data . for instance , student attendance is drowsy to go to a specific class, so student helped him/her to complete desk work for the cooperation which truly understudy A didn't go to the arrangement , anyway the system dismissed this matter appreciation to no prerequisite

practiced. Accepting the association develop execution, it'd got the opportunity to consume gigantic heaps of human resource and time which dynamically won't be sensible at all. Along these lines, all the recorded support inside the past structure isn't strong for examination usage. The second issue of the past structure is where it's additionally included.

Tolerating the time taken for a student to sign his/her support on a 3-4 paged name list is around 1 second. In an hour, just around 60 student can sign their cooperation which is doubtlessly inefficient and monotonous. The third issue is with the accessibility of these information by the bonafide concerned assembling. For a model, most of the oldsters are uncommonly stressed to follow their youth's veritable whereabouts to guarantee their kid genuinely go to the classes in school/school. At any rate inside the past structure, there are no ways for the oldsters to access such information. Therefore, advancement is should have been done to the past structure to overhaul capability, data precision and offers receptiveness to the data to that genuine social occasion.

2. LITERATURE SURVEY

2.1. Face Recognition Attendance System Based on Real-time Video

Decide if there is a human face, in the event that there is a human face, further give the position, size of each face and the position data of each significant facial organ. In light of this data, the personality highlights contained in each face are additionally separated and contrasted with known countenances with recognize the character of each face. Examination information shows that the precision of the video face acknowledgment framework is about 80%. The face identification time participation framework and manual unique mark punching are more steady and effectively distinguish registration.

2.2. Face Recognition Based Attendance Monitoring System using Raspberry-pi and OpenCV

Face identification based participation observing framework utilizing Raspberry pi are additionally clarified. The interaction of individual distinguishing proof by utilizing face acknowledgment can be parted into three principle stages. These are enlistment and standardization, include extraction and order. Face acknowledgment henceforth identified face has been taken and afterward by applying haar based course highlight, limit an incentive for that picture is determined and afterward particular id is given to the picture. In the event that edge worth of that picture matches with the limit worth of the information base picture, separate name is given to that picture.

2.3. Attendance System using Multi-face Recognition

The LBPH recognizer is utilized to mentor these countenances in light of the fact that the training set goal and in this manner the perceived face goals are very surprising. it has been resolved that LBP based principle offers least bogus positive rate and savvy acknowledgment rate because of it appropriately separates between the obscure and praised faces. LDA can fabricate right segregation between pictures as long as the separation is given at spans the data.

2.4. Development of Real Time Face Recognition System Using OpenCV

Programmed face identification (PFI) is a composite errand that includes location of appearances from a jumbled foundation, facial component extraction, and face identification. A complete face acknowledgment framework needs to take care of every single sub issue, where everyone is a different examination issue. This examination work focuses on the issue of facial element extraction and face recognizable proof. Encode an image utilizing the HOG algorithm to make a worked on rendition of the picture. Utilizing this improved on picture, discover the face part of the picture that most appears as though a conventional HOG encoding of a face.

3. EXISTING SYSTEM

There are numerous frameworks are created in designing universities and enterprises to remain a track of the participation. The created frameworks are acceptable however their presentation and strength issues. The created frameworks are:

Biometric built System

The Biometric built frameworks take a particular a piece of the actual body and use it for attendance the board framework for example iris, nostrils, retina, palm, fingerprints and so on the information keeps increasing and in this way the framework should be kept up, revived and as often as possible refreshed for some time in the future. The attendance framework utilizing Computer or android gadgets gives a more affordable arrangement contrasted with the biometric based frameworks. The iris acknowledgment framework is useful framework however the most disadvantage is it can make wounds the consideration. A comparable goes for face acknowledgment which guarantees uniqueness yet has an identical downsides.

Bluetooth built System

This framework has high convenience and intermediary expulsion strategies are regularly included to shape the framework great. In any case, the framework isn't versatile and requires 8 associations dynamic at a time. Bluetooth don't permit very 8 associations all at once this is regularly because of an expert and slave idea.

This excess makes it a plausible asset for a restricted public.

RFID built System

RFID frameworks are famous than Bluetooth based framework. Understudies are given RFID cards in their schools and universities close by their Identity cards. These cards are placed into the RFID per user before the researcher enters the homeroom. These frameworks require lasting management since understudies can put two cards inside the RFID per user bringing about an intermediary and furthermore improper utilization can hurt the RFID per user. RFID per user additionally requires support.

3. PROPOSED SYSTEM

Our proposed works on 3 divisions an introduction for all being given to having a correct understanding.

The first one is creating a database of the scholars, the system uses python code using OpenCV to organize a database of the person sitting ahead of the camera in various moods and positions. This is often only a one-time procedure. The pictures captured and segmented are going to be added to the database for the continual update of the database. The other is face detection; a high definition camera is employed to capture the photo of the entire class.

The captured image is then segmented into faces employing a well-known algorithm i.e. haar cascades designed by viola jones for face detection. This algorithm eliminates the problems of illumination, rotation and scaling to some extent. The third one is face recognition; the system uses an area binary pattern (LBP) to acknowledge the face. Histograms of every block are made and block histogram is concentrated into face image. The fundamental LBP manager labs the pixels of the image by limit the pixels with the middle pixel. If the worth of the neighbor pixel is bigger than or adequate to the middle pixel, the neighbor pixel is assigned as 1 else 0.

3.1. Building the databank

A database of the relative multitude of researchers will be made utilizing python and OpenCV. It's a onetime interaction all together that we'll make some evident memories information base to mentor our framework and to coordinate with the caught faces. For making an individual's data set, the individual must sit in front of the camera around 80 centimeter distant from the camera with light on the opposite side of the face. The camera should be at level of the essence of the individual. At the point when the code runs, the individual must give two stances with various articulations all together that a data set of different kinds of photograph gets made. The postures are regularly looking sideways, up down or any course during which face is apparent.

The articulations to be recorded are frequently glad, dismal, exhausted, yawning and so on likewise the countenances distinguished from the caught pictures will be added to the data set all together that the information base is refreshed persistently. When the information base is finished we are prepared with our execution part.

3.2. Taking the image files

Our proposed works A Best quality camera will be presented inside the classroom over the board all together that it could get all of the analysts present inside the class. The camera are as often as possible truly controlled or adjusted by the decision of the customer. In the wake of getting the image, it'll be dispatched off the system for additional handling.

3.3. Face recognition and separation consuming Haar cascades

At the point when the system gets the data picture, it'll be taken care of and every one the faces present will be recognized using haar course feature of Open CV. The image by then will be separated to all or any the countenances present and can be taken care of during a record for that specific date.

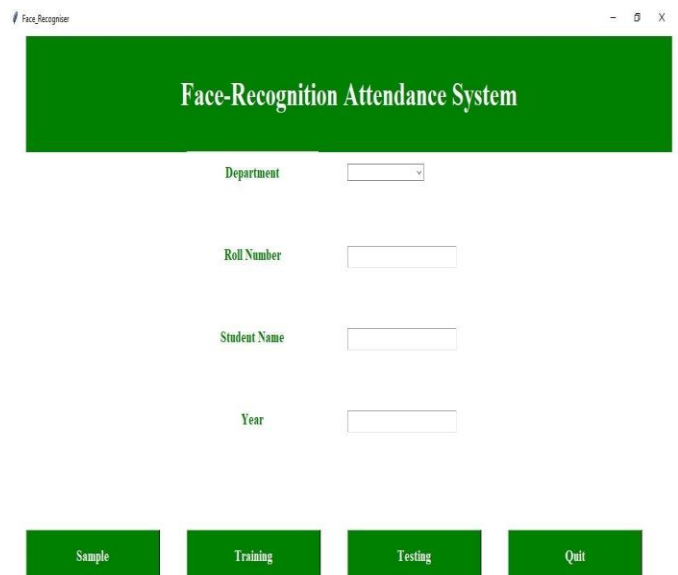


Fig -1: Extracting Front page of Face recognition attendance system

3.4. Training Faces

The image square measure saved in dark scale, as all appearances is recorded by a class camera. The LBPH recognizer is utilized to show these countenances on the grounds that the training set goal and in this way the perceived face goals are very surprising. So some investigation focused on removing local decisions from photographs. The thinking is to not check side by side of the whole picture as a high-dimensional vector, however portray altogether local decisions of partner object. The choices you remove this style will have an espresso dimensional verifiable. A fine thought! However, you'll as of now notice the picture representation we tend to are given doesn't totally experience the ill effects of enlightenment varieties.

A more formal description of the LBP operator remain frequently assumed as:

$$LBP(x_c, y_c) = \sum_{p=0}^{P-1} 2^p s(i_p - i_c)$$

For an accepted Point (x_c, y_c) the situation of the Neighbor (x_p, y_p) , $p, \in P$ are frequently

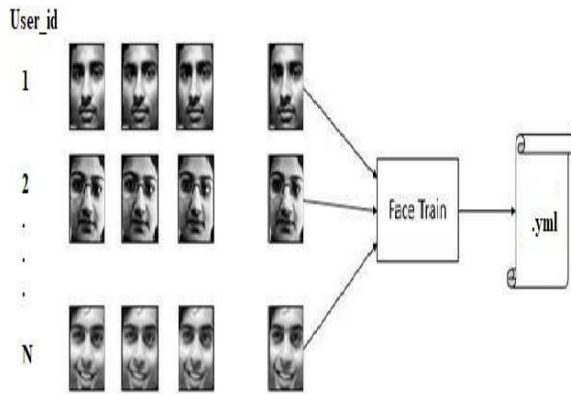


Fig -2: Extracting training faces

3.5 Attendance Indicator

At the point when all of the faces are divided into different appearances, we'll run the face acknowledgment code. All of the face appearances from the authentic date coordinator will be checked with the informational collection using the close by twofold model computation and if similar face is found the photo will be added to the informational collection for better viability in future.

$$f(x, y) \approx [1 - x \quad x] \begin{bmatrix} f(0,0) & f(0,1) \\ f(1,0) & f(1,1) \end{bmatrix} \begin{bmatrix} 1 - y \\ y \end{bmatrix}$$

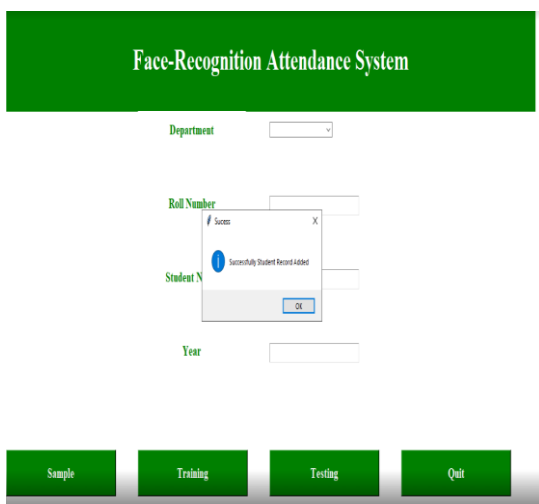


Fig -3: Training faces

In Training Phase it is isolated in to two sections: 1.Capture 2.Train Capture For building the preparation data set continuously, to catch the Department, move number of understudy, Student name, year of contemplating and catch

the pictures of an individual, first we are enter the individual name, at that point the framework will catch the pictures of that Particular Person remaining before camera.

In the wake of Capturing preparing pictures of the relative multitude of individuals, we need to prepare the framework to get face models for all individuals. The preparing technique is as of now clarified in the past section.CMU Open face having a few models for recognizing faces in the pictures.

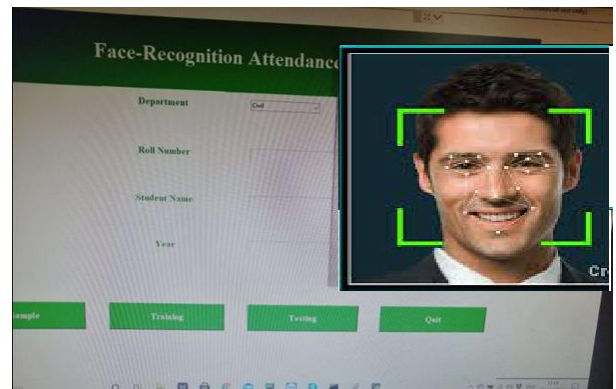


Fig -4: Train the data

3.6 Merits of the proposed system

- Human – Computer Interaction (HCI)
- Object Identification
- Object Recognition
- Face Recognition
- Gesture Recognition
- Motion Tracking
- Image Processing
- Mobile Robotics

4. CONCLUSION AND FUTURE ENHANCEMENTS

4.1. Conclusion

Face identification innovations are related by and large with exorbitant top secure applications. Today the center advances have developed and subsequently the expense of gears goes down drastically on account of the blending and in this way the expanding handling power. Certain uses of face acknowledgment innovation are currently savvy, solid and profoundly precise.

The venture manages the execution of a Face Recognition System Using GUI. Different calculations for identification and acknowledgment of a face during a given picture are examined as a neighborhood of the Literature. The calculation that has been utilized for Face Detection during this task utilizes the identifying the face part by Using HOG calculation, here during this each and every pixel is contrasted and adjoining pixels at that point it'll distinguish the picture with 68 tourist spots by utilizing face land mark

calculation; After recognizing the face a piece of the given information picture, we are separating the 129 highlights/installing's by utilizing Deep Neural organization idea.

4.2 Future Enhancements

In the coming future, as information propels, more development designs will be extra to the face recognition framework.

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