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Face Recognition Based Automated Attendance System Using Open-CV and Python

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ABSTRACT: The control of the attendance can be an awesome burden on the teachers if it is completed by hand. To solve this problem, smart and auto-generated attendance this management system is being utilized. By utilizing this framework, the problem of proxies and college students marked presents even though they may not be physical. The presents can be easily solved. The frames are extracted from video by using the Open-CV. The principle implementation steps used in this sort of gadget are face recognition and spotting the face detected. After, thus the connection of diagnosed faces ought to be plausible with the aid of comparing with the database containing student's faces. This Version is a successful method to manage the situation of student's attendance. This version is not only used for the classroom but also we can use any condition where this auto face recognition or auto faces detection methods needs.

KEYWORDS: Attendance, face detection, face recognition.

I. INTRODUCTION

Faces are playing an important role to identify anyone's identity. Face acknowledgment is a part of the biometric personality that separates the facial elements of a face and afterward stores them as very remarkable faces. Biometric face notoriety the period has gotten the eye of numerous specialists because of its tremendous utility. Face detection in the present day is superior to other biometric detection. Other technique like finger impression, palm print, it physically contacts methods to identification whereas face recognition is method does not need any physical contact it is auto recognize face and perform the operations. Now social media use face recognition methods, smart devices like mobile phones, laptops, etc. other than this face reorganization methods are also used in airports and railways station. This face recognition method is also beneficial for crime investigation. Throughout the most recent few years, an amazing improvement has been made in facial recognition structure.

II. RELATED RESEARCH

In [1], the authors of "Face Recognition Based Attendance Monitoring System Using Raspberry-pi and Open-CV" (Omkar Biradar, Anurag bhawe, 2019). In this research author present that the attendance is marked with the aid of the usage of a digital camera attached with the system, which captures pics of scholar's employees, stumbles on the faces in pics, compares with the detected faces, which are in the scholar database, and marks their attendance. Then the attendance could be up to date robotically at the web page, which they have created with the aid of the use of face recognition and face detection. The facial popularity procedure may be divided into essential degrees processing before recognition where face recognition and face detection take location and afterward popularity arises via function extraction.

In [3], the authors of “Automated Attendance System Using Face Recognition” (Akshara Jadhav, Akshay Jadhav, Tushar Ladhe, Krishna Yeolekar, 2017). In this research, the author presents that this face recognition is secured. Is based totally on face recognition strategies hence proved timesaving and secured. This system is used to perceive unknown individuals. The author detects that while the person enters a room then the attendance is marked via spotting that person in actual time eventualities, PCA plays higher than the different algorithms with higher face recognition and low fake high-quality rate. The main work is to improve the recognition rate of algorithms while there is a change in person like tonsuring head, beard. The machine development only acknowledges resisting 30 tiers perspective variations, which must be advance in variation.

In [4], the authors of “Face Recognition Based Attendance Marking System” (Senthamil Selvi, Chitrakala, Antony Jenitha, 2014) in this research author present that the identification of face recognition to solve the previous attendance systems issues. This device uses digi-cam to seize the picture of the worker, students to do face recognition and popularity. The captured images are compared with the face database to search for the workers and college student faces in which attendance may be marked while a result is discovered within the face database. The main advantages of this system were where attendance is marked on the server, which is pretty secured in which no one can mark the attendance of different. Moreover on this proposed system the face recognition algorithm is advanced through the usage of the pores and skin classification approach to growing the accuracy of the recognition methods.

Although greater efforts are invested in the accuracy of the face recognition set of rules, the device is yet no longer transportable. This gadget calls for a standalone laptop as a way to need constant electricity delivers that makes it no longer portable. This form of machine is simpler suitable for making workforce attendance, as the most effective wants to report their presence once an afternoon, unlike the students which required reporting their attendance at every elegance on a particular day, It is inconvenient if the attendance marked machine is not a transportable module to that could be worked just by ways of executing the python application.

In [5], the authors of “Implementation of automated attendance system using face recognition” (Mathana Gopala Krishnan, Balaji, Shyam Babu, 2015). In this research author present, that allows you to reduce the recognition attempt and to control the time effectively. The authors proposed an automated attendance machine using face detection, which is very beneficial for schools and companies responsible for taking attendance. The device takes attendance for a precise quantity of time and after the time expires, the system robotically closes the attendance. The device will understand the face and save the info regarding attendance in the database mechanically. The gadget includes the characteristic that creates the listing of college students who are absent on a particular day the machine uses the Eigenface approach for face popularity. The method analyses and computes Eigenfaces which might be faces composed of Eigen-vectors. The method also compares the Eigenfaces to identify the presence of someone (face) and its identification. The approach involves the following steps. A first step ought, to begin with, to initialize a hard and fast of schooling faces. Then, the system compares the eigenvectors of the contemporary face and the saved face photograph and determines whether the face is recognized or not. The final step is that if the unknown face is detected repeatedly the device may additionally discover ways to recognize it.

III. PROBLEM STATEMENT

A few are taking attendance manually the usage of the conventional pen and paper or report based on a total approach but marking attendance is a lengthy process and takes a lot of time. Effort and time, specifically if it is a lecture with a big quantity of students. Additionally, handling the records of a huge range of the high number of students frequently results in human errors. Therefore, we are imposing a gadget to routinely record the student’s attendance for the duration of lecture hours in a corridor or room with the use of the facial recognition era. This mission deals with one of the proven feasible solutions.

IV. PROPOSED WORK

A few are taking attendance manually the usage of the conventional pen and paper or report based on a total approach but marking attendance is a lengthy process and takes a lot of time. Effort and time, specifically if it is a lecture with a big quantity of students. Additionally, handling the records of a huge range.

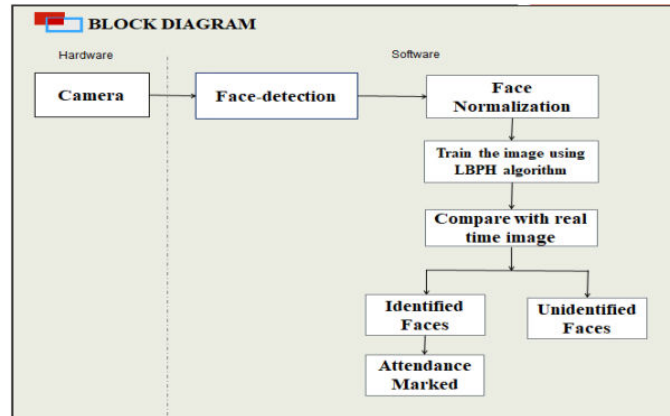


Figure. 3 Block Diagram of Face Recognition Methods

In a first want to register the particular person profile which is shown in first basic windows in the system. If the person is, register with their profile in the module then the camera sensors senses and started to scan the profiles, which is present in the database. The then-created profile will be saved as data sets. Now the second part of the block diagram will play a major role to perform all the operations for face recognition methodology. If the person profile scan and face is detected then that the face which is detected follows the process of face normalization in this face normalization method the background of particular images and pics are avoided canceled.

Local Binary Pattern (LBP) is a straightforward yet productive surface administrator which names the pixels of a picture by thresholding the neighbourhood of every pixel also, thinks about the outcome as a paired number. LBPH has four parameters radius, neighbours, grid x and grid y. The radius is utilized to make the circular local binary patterns address the radius around the focal pixel. It is generally set to 1. For neighbour the number of sample points needed to construct a circular binary pattern, it usually set to 8. About grid x cells are in the horizontal direction, to get the finer grid to want to include more cells, it is usually set to 8. And last grid y the number of cells in the vertical direction same for grid y to get the finer grid to include more cells [2].

Firstly, need to train the algorithm, To do such, we need to utilize a dataset with the facial pictures of individuals we need to perceive. We need to likewise set an ID (it very well might be a number or the name of the individual) for each picture, so the calculation will utilize this data to perceive an information picture and give you a yield. Pictures of a similar individual should have something similar ID.

The initial step of the LBPH is to make a middle-of-the-road picture that depicts the first picture in a superior manner, by featuring the facial attributes. To do as such, the calculation utilizes an idea of a sliding window, based on the parameter radius and neighbors. Presently, utilizing the picture produced in the last advance, we can utilize the Grid X and Grid Y boundaries to isolate the picture into various networks. After this one, the algorithm is already trained for each dataset created every histogram made is utilized to address each picture from the preparation dataset.

V. SOFTWARE & HARDWARE SPECIFICATION

A. Hardware Specification

1) Camera: To capture the real time images we need the camera that captured the images into to database.

Feature

- 20 Megapixel High Resolution Camera
- Video resolution: 320*240
- Image focus: 5cm infinity

B. Software Specification

1) Python: Python is an incorporated, object arranged language, high level programming language with dynamic semantics. Its significant level implicit information structures, joined with dynamic composing and dynamic restricting, make it exceptionally alluring for quick Application Development, just as for use as a prearranging or paste language to associate existing segments together. Python's basic, simple to learn sentence structure accentuates clarity and accordingly decreases the expense of program upkeep. Python maintains modules and groups, which



enables program distinction and code reuse. The Python interpreter and the expansive standard library are open in source or equal design without charge for every critical stage, and can be uninhibitedly circled.

2) Open-cv: This algorithm can be used for face detection, identification of objects, classification of human actions, tracking movements, trace moving objects, 3D model object. Open-cv is an open source PC vision and AI programming library. It assumes a significant part continuously activity, which is vital in today framework.

VI. RESULT AND DISCUSS

In this work, each picture in the face data set has a particular ID number. In the first place, set up the face data set, and at that point remove the LBP surface highlights of each test picture. At last, order and perceive the face data. We contrast the information face pictures and data set face pictures and work as though the given appearance pictures, after extricating feature compared with the dataset so at long last we can sort out the face picture is well recognized in any case the face picture would not be recognized it will show “No match found” and person images is saved in system. The working module shown in (Figures 6, 6.1 and 6.2).

A. Face Detection

In this step face is capture via camera and taken that images as an input for train that images as datasets where the picture is capture in gray scale images.

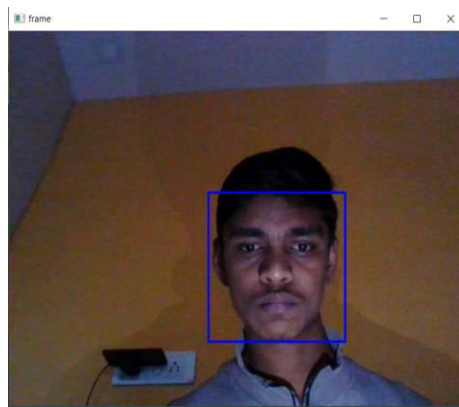


Figure. 6 Face Detection

B. Training Images

For training images we has use LBPH algorithm and create the gray scale datasets in database. The created dataset is shown in Fig. 6.1.



Figure. 6.1 Training Datasets

C. Final Result

After the completion of trained datasets that one compared with real-time captured images and if the individual is found that identified face then the attendance will be marked otherwise is there found that unidentified face then it shows that “No match found”.

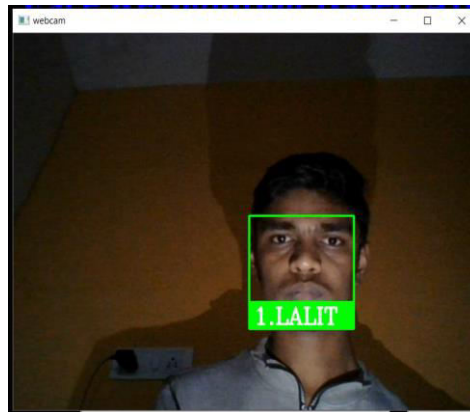


Figure. 6.2 Recognized Face.

In the above Fig. 6.2 face recognition is completed and show the ID number and name identified individuals.

VII. CONCLUSION

As an applying this methods finally the best outcome come from this method using the algorithm LBPH its near about 90% accuracy shown using this method. This can be done using the python and OPEN-CV for feature extraction process. These methods recognized the multiple faces from a single frame using no lower time.

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