Analysis of Expression Identification Framework for Data Entry

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Abstract— These days, the mainstream data management system used is time-consuming, clunkyand/or can be exploited. Most of these devices out there, but sometimes both are either or cost-effective. This paper proposes a Dependent Attendance Method for Facial identification that aims to accomplish both. A machine learning system utilises the Facial Recognition Based presence System to train and associate a model with a name. This method consists of four phases: development of the database, identification of faces, recognition of faces, updating data . The database is made up of pictures of students in the classroom. Both the Haar-Cascade & the Local Binary Sequence Histogram algorithms are used for facial identification and recognition. Live stream footage of class, faces are identified and recognised. This is done with the help of a python computer vision module named OpenCV. A UI component that uses the Tkinter UI module is also available for this framework. For the entire system, hardware such as small cameras and a computing unit will be required. The system's accuracy is good making it very viable. The system only needs one stage, that is a photo capture of an individual, once the model is trained to recognise a person. Thanks to its unique facial recognition-based Machine Learning solution, this proposed product provides a simpler, fool-proof, and cost-effective alternative to the mainstream attendance system.

Keywords—biometric; recognition system; Face Recognition; Deep Learning; OpenCV; Machine learning; computer vision; management system.

I. INTRODUCTION/PROPOSED WORK

In many schools and universities, the conventional form of attendance marking is a boring activity. The conventional form of attendance marking is a boring activity in many schools and universities. It is also an time consuming process . Also, proxy attendance is risky. Therefore, some form of automated attendance system is used by many institutions. RFID device, Iris recognition, fingerprint censors, etc for example. However, many of them require queue.

An important biometric function has been constructed for face identification that can be quickly obtained and is non-obtrusive. Systems based on facial identification are largely insensible of common facial expressions. Two categories consist of the facial recognition method: face authentication and identification. Face recognisation is a 1:1 matching procedure that compares the face image to the face images of the prototype and compares the face image of a query to a 1:N problem.

The goal of this system is to create an attendance system that uses face recognition methods. In this case, an individual's face will be used to indicate engagement. Face recognition is becoming more commonplace and has been widely used in recent years. In this paper, we suggest a framework for detecting students' faces from live video streaming in the classroom and labelling attendance if the detected face is recognised in the database. In comparison to traditional methods, this new system may take less time.

II. LITERATURE REVIEWS

In the field of computer vision, there has been a lot of research that has helped to drive this technology forward. Modules such as OpenCV are premade modules that are optimised for computer vision and thus facial recognition with ML models. We can use this to make a scheme of attendance based on facial recognition. While there are many research and product ideas that use facial recognition, there is no one that uses it in this particular way.

There are several attendance programmes in the existing market that are being used. Smart card-based attendance system, Iris-based, fingerprint-based, Punch card-based are some of them. They are often clunky, old,and/or can be abused. Most of these devices out there, but sometimes both are either fool-proof or cost-effective. This paper proposes a Dependent Attendance Method for Facial Recognition that aims to accomplish both.

1.Research Development
Developing and Ai advance system to verify and store data with facial expressions.

2.Desigining of the system
According to the convenience of the user, system will have a feature to delete the stored data. Incase user want to remove certain data so it will have remove button.

3. Security aspects
Data stored with higher security for the safety of the user and making it secure with different layers of security.

III. PROBLEM FORMULATION

Traditional systems of attendance are sluggish, expensive and/or can easily be misled or have other issues. In the industry, there are few ways of attendance systems such as fingerprint, iris, smart card, punch card, etc. In saving copies of fingerprints and iris, fingerprints, iris and smart cards will take a lot of memory and take a decent amount of computing power to compare. Normally, these devices are very expensive. And it can only be used by one person at a time. Smart card system uses a card and these cards can be misplaced or lost easily. And if a person loses it even if he / she is present, he / she will not be able to get the attendance for the day. Not to mention that the cost of producing a smart card is high. Punch card systems are getting old and you can easily trick them.

Our aim is to solve these problems by making robust attendance management system powered by ML.

IV. REQUIRED TOOL

This framework is going to be developed in Python because this language is simpler and easier to run. Since this is a device based on facial recognition, it will require some form of computer vision solution based on ML. And we will use a computer vision python module called OpenCV for this.

We will also be implementing a UI component. And you can use Tkinter for that as it is fast, simple, portable and stable.

V. FEASIBILITY ANALYSIS

Industry requires a fast and effective attendance management system. This method is both cost-effective and fool proof compared to other attendance schemes, such as a punch card or a finger or a smartcard system. Since facial recognition is already widely used in a number of locations, it is already technically feasible. It can simultaneously detect multiple faces, making this device very fast. A device like this only needs to be trained once and can then extremely reliably identify faces. It just takes a small, inexpensive camera, a computer unit and an internet connection to make it cheap on the hardware side.

VI. MERITS

Our system offers a wide range of benefits that goes past what typical standard participation system offers.

Contrasted with others, our system offers a serious level of robotization. A system like this naturally catches, identifies and record participation in a CSV document for sometime in the future. This system can likewise be expanded or coordinated with online participation entryway for a total mechanization. The mechanization slice

down on time taken to take the participation so the educators can invest more energy instructing.

Since this system has a GUI, the usability factor is high. The staff just requirements to press a couple of catches to record the participation. This system can likewise recognize different faces on the double creation it very quick.

A subject of conversation may emerge with respect to the achievability of the system as far as its capacity to dependably recognize faces. This point can be disposed of on the grounds that our system utilizes a ML model, a Haar-Course Classifier, making it very dependable. Since we have set up that this system is exceptionally solid, we can likewise build up that checking intermediary participation will be close to inconceivable. Our system can likewise join a profundity detecting camera to recognize profundity and thus decern photographs.

Ultimately, comes the worry of cost adequacy. Our system has three principle parts: show for the GUI, camera to catch faces and a figure unit to prepare. These segments exclusively are now exceptionally modest making it genuinely less expensive than some other biometric participation system. Our system can likewise utilize an IOT approach where the camera and show are associated with a concentrated processing unit making this system much less expensive.

VII. ARCHITECTURE DIAGRAM

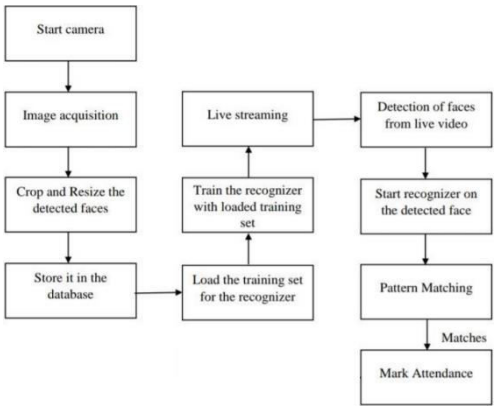

Fig 1. Architecture Diagram

VIII. IMPLEMENTATION

The above architecture diagram describes the process/algorithm of the attendance system.

The process can be divided into 4 main stages:

1) Dataset Creation

Photographs of the students are taken with a webcam. Using a range of actions and viewpoints, many photos of a single student are taken. On such photos, pre-processing is used. Cropping the photos provides a zone of interest for the recognition process. The clipped photos are then scaled down to the size of a pixel. The photos will then be converted to grayscale from RGB. These photographs are then saved in a folder with the professors' names on it.

Face Identification

In this example, the OpenCV Haar-Cascade Classifier is used to detect faces. Before it can be utilised for face identification, the Haar Cascade algorithm must first be trained to recognise human faces. The process is known as function extraction. The training data for the haar cascade is an xml file named haarcascade frontalface default.For feature extraction, the hair features shown in Fig.2 will be used.

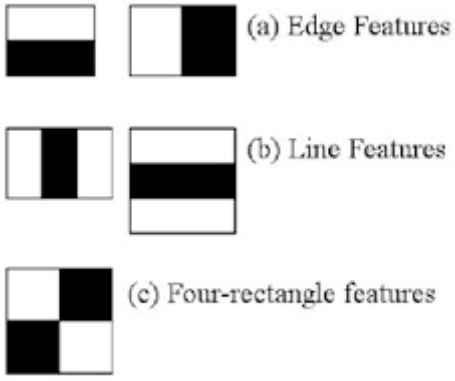

Fig 2. Haar Features

Here, we use the OpenCV DetectMultiScale module. This is required in order to draw a rectangle around the faces in a photo. ScaleFactor, minSize, and scaleFactor are the three parameters to consider. This was once used to show how much each image scale shrinks an image. The number of neighbours in each candidate rectangle is determined by MinNeighbors. Higher levels often detect fewer faces, but they do so with high

image quality. minSize specifies the minimal object size. It's in the nature of things (30,30). The parameters utilised in this method are scaleFactor and minNeighbors, which have values of 1.3 and 5, respectively.

2) *Face Recognition*

Face recognition can be broken down into three stages: data preparation, face recognizer training, and prediction. The training data will be the photographs contained in the dataset. They will be assigned an integer mark according to the student to whom it pertains. These photos are then used for facial recognition. The Binary Pattern in the Local Environment The face recognizer utilized in this method is the histogram. Initially, the complete face's Local Binary Pattern (LBP) list is obtained. These LBPs are then transformed to decimal numbers and shown via histograms. At the completion of the process, each image in the training data will have its own histogram. Following that, during the identification process, the histogram of the face to be identified is determined, and after comparison with the previously computed histograms, the better-matched mark linked with the student to whom it belongs is returned.

3) *Attendance Updation*

After the facial recognition process, the recognised faces can be labelled as present on the excel sheet.

IX. DESCRIPTION OF PROJECT MODULES

1) *Tkinter*

Tkinter is a toolkit that links Python to Tk GUI. The basic Python interface used for the Tk GUI toolkit and is the de facto GUI for Python. Normal Linux, Microsoft Windows and Mac OS X installations of Python include Tkinter. The name Tkinter originates from the gui of Tk. It was written by Fredrik Lundh Tkinter. The free software published under a Python licence is Tkinter.

Here, the Tkinter module is liable for delivering the UI for our participation system. The clients can cooperate with the system utilizing a GUI. Here clients will be chiefly furnished with three distinct choices, for example, understudy enrollment, personnel enlistment, and imprint participation. The understudies should enter all the necessary subtleties in the understudy enrollment structure. Subsequent to tapping on sign in tab, the camera begins consequently and a window springs up and begins recognizing the countenances in the edge. At that point it consequently begins clicking photographs until many examples gathered or CRTL+Q is used. These pictures at that point will be pre-handled and put away in preparing pictures envelope.

2) *OpenCV*

OpenCV is used as library containing programming functions that focuses on computer vision of real-time. It was designed by Intel, and subsequently funded by Willow Garage and Itseez. The library is free to download and cross-platform in BSD open source licence.

Here, face detection is carried out using the OpenCV Haar-Cascade Classifier. We are using the OpenCVDetectMultiScale module here. . This is required in order to draw a rectangle around the faces in a photograph. This is required in order to draw a rectangle around the faces in a photograph. There are three criteria to consider: scaleFactor, minNeighbors, and minSize. The scaleFactor is used to indicate how much each image scale must be reduced. MinNeighbors determines the number of neighbours to have in each candidate rectangle. Higher values typically detect fewer faces, however high image quality is detected. A minimum object size is defined by minSize. It is by nature (30,30). ScaleFactor and minNeighbors are the parameters used in this method, with values of 1.3 and 5 respectively.

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XI. CONCLUSION

Using face recognition techniques, marking through facial expressions using face id, will be use to mark attendance. Using camera it can be used to detect and identify the person using system. It will mark after recognizing and update the record of presence. It is an efficient system and can be used after scaling up.

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