IOT based Automated Attendance with Face Recognition System

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Abstract

Our paper involves the student attendance and faculty attendance .The student attendance is marked by face recognition .For face detection and face recognition the raspberry pi .The camera is connected to Raspberry pi USB port only images will capture of the scholars who are present within the class for face detection. The captured images recognizes with stored images then in that images we will recognize the faces of every student and according to that attendance will be given to that subject class. This process is carried out every class and students are given attendance accordingly .Attendance will be marked with date and time. We can mark the attendance at any time without any human intervention

1. INTRODUCTION

This is developed to mark the attendance for students and faculty without any person interference that makes very useful for colleges and schools to mark the attendance easily .This system helps for the people by saving time they can know the attendance academic performance anywhere by registering in student/faculty registration in web page which has been developed in this paper.

The present day attendance system is manual . wastage a considerable amount of time both for teachers and students .The waiting time of the students is increased if attendance is taken manually .There are still chances for proxies within the class attendance is taken manually .Manual attendance always a have a price of human error .Face is that the essential recognizable proof for any human .So automating the attendance process will increase the productivity of the category .To make it available for each platform we have chosen the Raspberry pi 3 for face recognition .A web cam is related to the raspberry pi module .Face identification separates faces from non faces and people countenances which will be perceived .This module can be utilized for different applications where face acknowledgment can be utilizes for validation in this

proposed system we take the attendance using face recognition which recognize the face of each student during the class hours

2. LITERATUREREVIEW

In holistic approach, the entire face region is taken under consideration as input file into face catching system. One of the best example of holistic methods are Eigen faces (most widely used method for face recognition), Principal Component Analysis, Linear Discriminate Analysis and independent component analysis etc.

The first successful demonstration of machine recognition of faces was made by Turk and Pent lands 1. In 1991using Eigen faces. Their approach covers face recognition as a two-dimensional recognition problem. The flowchart in Figure 1 illustrates the different stages in an Eigen face based recognition system. The primary stage is to insert a group of images into a database, these images are names because the training set and this is often because they are going to be used when we compare images and once we create the Eigen faces 2. The second stage is to create the Eigen faces. Eigen faces are made by extracting characteristic features from the faces. The input images are normalized to line up the eyes and mouths. They are then resized in order that they need an equivalent size. Eigen faces can now be extracted from the image data by using a mathematical tool called Principal Component Analysis (PCA) 3. When the Eigen faces have been created, each image will be represented as a vector of weights 4.The system is now able to accept entering queries 5.The load of the incoming unknown image is found then compare to the weights of those already in the system. If the input image's weight is over a given threshold it is considered to be unidentified. The identification of the input image is completed by finding the image in the database whose weights are the closest to the weights of the input image. The image in the database with the closest weights are going to be returned as successful to the user of the system

Hybrid face recognition systems use a mixture of both holistic and have extraction methods. Generally 3D Images are utilized in hybrid methods. The image of an individual's face is caught in 3D, allowing the system to note the curves of the attention sockets, as an example or the shapes of the chin or forehead. Even a face in profile would serve because the system uses depth, and an axis of measurement, which provides it enough information to construct a full face. The 3D system usually precedes this Detection, Position, Measurement, Representation and Matching.

Detection - Capturing a face either a scanning a photograph or photographing an individual's face in real time. Position - Determining things , size and angle of the very best Measurement -

Assigning measurements to every curve of the face to make a template with specific concentrate on the surface of the eye , the within of the eye and thus the angle of the nose.

Representation - Converting the template into a code - a numerical representation of the face and Matching - Comparing the received data with faces within the prevailing database. Just in case the 3D image is to be compared with an existing 3D image, it must have not any alterations. Typically, however, photos that are put in 2D, and there just in case , the 3D image need a few of changes. This is often tricky, and is one of the foremost important challenges within the sector today

3. PROPOSED SYSTEM

From fig. 1 The USB Camera is connected to the raspberry pi camera slot. Live video stream of scholars is captured within the class with USB 1 camera, Raspberry pi takes those images as input images and uploaded to the AWS cloud platform and that we make use of face recognition service to match the input images with the prevailing image .Matched images are detected and attendance is marked with date and time for college kids present in school within the local data base using MYSQL. This process is administered for each period and students are given attendance accordingly. This happens thanks to importing the open CV packages at the initial stage of the event of the system. Faculty attendance is monitored with this project .The web application is meant for the output purpose to ascertain the list of students/faculty, present and absent for each hour within the class. Admin tracks the attendance of the scholars periodically or whenever required by the administration and finds the result. The result's displayed on the monitor screen. Student/Faculty attendance are going to be monitored and if the student/faculty is absent for that class then the notification will send to the HOD and parents

In our proposed system the scholar attendance is marked by face recognition. For face detection and face recognition the raspberry pi is employed . If the camera is connected to Raspberry pi USB port then only images will capture of the scholars who are available within the class for face detection. The captured images recognizes with stored images then therein images we'll recognize the faces of each student and consistent with that attendance are going to be given thereto subject class. This process is administered for each class and students are given attendance accordingly .Faculty attendance is monitored with this project .The student database includes the stored images which can be compared by captured images to mark the attendance and school database includes their registered numbers which can be compared by RFID tag number then attendance for the school is marked

The Raspberry Pi may be a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a typical keyboard and mouse. it's a capable little device that permits

people of all ages to explore computing, and to find out the way to program in languages like Scratch and Python. This Raspberry pi equipped with ENC28J60 which may be a Ethernet chip to urge connected with internet [6]

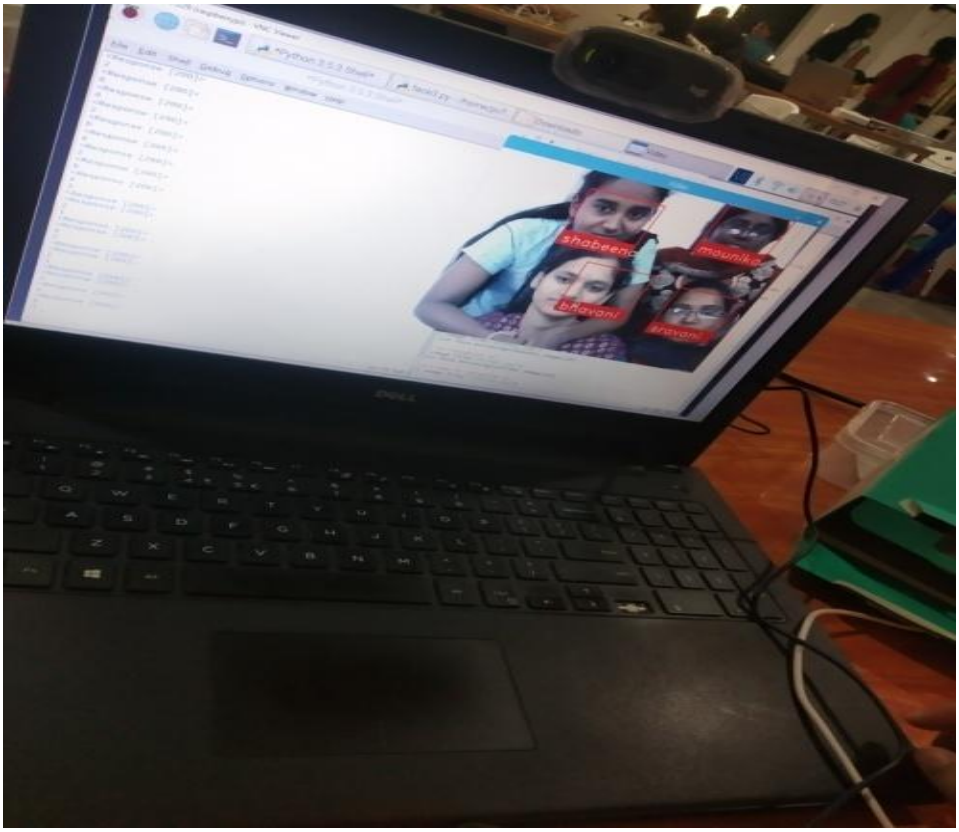

Fig.3 Proposed System

4.CONCLUSION

In this developed system ten faces were detected and recognized, the attendance was marked hour wise and monthly wise percentage of each Student/Faculty are stored in web app and SMS will be sent to Parents/HOD. Further, Raspberry Pi development board is a cost effective fully functional computational system can be used for many applications, Camera modules are also cost effective and can be used for surveillance systems. Using Python and Open CV in Raspberry Pi made our project flexible and adoptable to any required future channel

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