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REAL TIME SMART ATTENDANCE SYSTEM USING FACE RECOGNITION

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Abstract — To maintain a discipline and let students grasp utmost knowledge in schools, colleges and universities the attendance system was introduced. There are two conventional techniques to mark attendance of students in a particular class. One of them is by calling the roll number and the second is to take students sign on a piece of paper against their roll number. Hence there was a need to evolve this system in such a way that it could become user friendly, less time consuming and efficient. This is an automated system to assist the faculty in taking attendance of the whole class without any disturbance or time waste. The idea can encompass a large number application one of which include face identification, it will help save time and efficiently identifies and eliminates the chances of proxy attendance. The main purpose of this project is to build automated attendance system using OpenCV/Python libraries and recognizer algorithm have been implemented.

Key Words: Attendance, face identification, Recognizer, OpenCV.

1. INTRODUCTION

Right Deep learning is a domain where it enables to create the captions of the chosen images. Deep Learning provides various packages to perform the challenges of image. Captioning via Keras, Keras Application, Keras pre-processing, Tensor flow, and long-short Term Memory. In this research, the focus is on the model of VGG16 (visual Geometry Graphics) to generate captions of the images via calculating the image pixels, image specification and image input size, and so on. Deep learning provides the architectures of image captioning like RNN and CNN. With the help of these two architectures, it can know the description of the image. Here, the image is processed through the architectures and VGG16 model. The particular chosen image is converted into convolutional neural network architectures and recurrent neural network architectures followed by the creation of the caption of the image with the long short term memory.

It can be broadly classified into two types, namely

- (1). Traditional machine learning-based approach.
- (2). Deep machine learning-based approach.

1. TRADITIONAL MACHINE LEARNING-BASED APPROACH.
The appropriate features are extracted from the input images. The input images are moved to processes such as SVM which makes them classify the objects of the images. Noticeably, it is difficult to understand the description of the real-world images such as medical images.

2. DEEP MACHINE LEARNING-BASED APPROACH
It is used to extract the features of the image through VGG_model architecture. In these techniques, both image and video can able to describe the contents of both things. CNN is widely used for image classification and a set of features from the images and followed by RNN to make the description of the image. See Fig. 1.1 Flow of DL.

2. RELATED WORKS

The exponential rise of technologies leads to the growth of various sources of images that are communicated over the internet or cloud. These data are useful to get an insight into some decision-making purposes for firms and related other institutions. The data can also be virtually present in cloud computing. Since most of the volume of the data using a multimedia form. It is vital to get knowledge of the multimedia data to make the optimal decision making.

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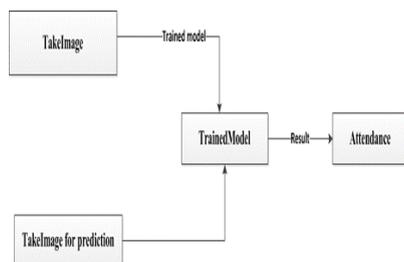
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First system, "Attendance System Using NFC Technology with Embedded Camera on Mobile Device" (Bhise, Khichi, Korde, Lokare, 2015). Near field communication is a type of short distance wireless communication that takes place between two devices, one active and the other passive. The two devices are basically inductor coils which can respond to an electromagnetic induction. The active device is utilized to produce an electromagnetic field of a given radius and strength. Which used to implement an attendance system. In a school setting for example, students can be given NFC tags that are uniquely programmed with their unique identification numbers. Upon attending the classes, the lecturers bring the NFC readers and a student is required to swipe their NFC tags near the reader, say the lecturers' phone. This information is then transmitted to the school database to mark the attendance of the student. However this system is vulnerable to impersonation where one person can sign in for someone else. The other related systems that use biometrics (Fingerprint recognition RFID, etc) to identify end user are time management systems used in many colleges, institutions and schools. However, these system introduce further privacy concerns. These systems are also subject to physical damage from their users. Therefore they need additional maintenance costs. The idea proposed by us, Removes physical access from anyone to the automated system.

A. ARCHITECTURE

The structure involves of two types of csv files such as student details and attendance details. The csv file consists of student y class, on the opposite hand, the attendance file, the name suggests, is for marking and maintaining, the attendance records of students attending a particular periods.



B. Methodology

To establish the real time face recognition based attendance system, it contains few basic steps

Required to be followed for accomplish this particular task successfully. Steps are:

- Register number
- Take image
- Train image
- Track image
- Attendance

Register number

In this step, the window is opened and ask to Enter I'd Common information like Name, Class, and Section is stored within the document. The student will become a component of the category. The most purpose of the register number to keep up student attendance list.

Take Image

This is the application to take care of student attendance by the automation. With the assistance of machine learning through the face recognition we are able to do the automation attendance for the recognition.

Train Image

To predict a student, the first thing is to do is to train the machine with student face. After training process, machine learns the student faces. The trained face is stored as a model. This model is used for prediction.

Track Image

Track image is that the process of finding given image from trained model. If that given image is accessible implies that face part are going to be highlighted with student name, if the given face isn't present within the trained model means he is unknown person.

Attendance

Final step during this process is marking attendance for the student by automation identified student are log in some document, which all are students not in documents are consider as absent. This is the method of the process of automatic attendance.

C. Algorithm

ALGORITHM:

SMART_ATTENDANCE_SYSTEM_USING_FACE_RECOGNITION

INPUT: Student basic details like roll number, id, name and face

OUTPUT: Marking student attendance automatically using face

PROBLEM: Predict correct person with taken image from camera and mark attendance accordingly

STEP 1: Start smart attendance application.

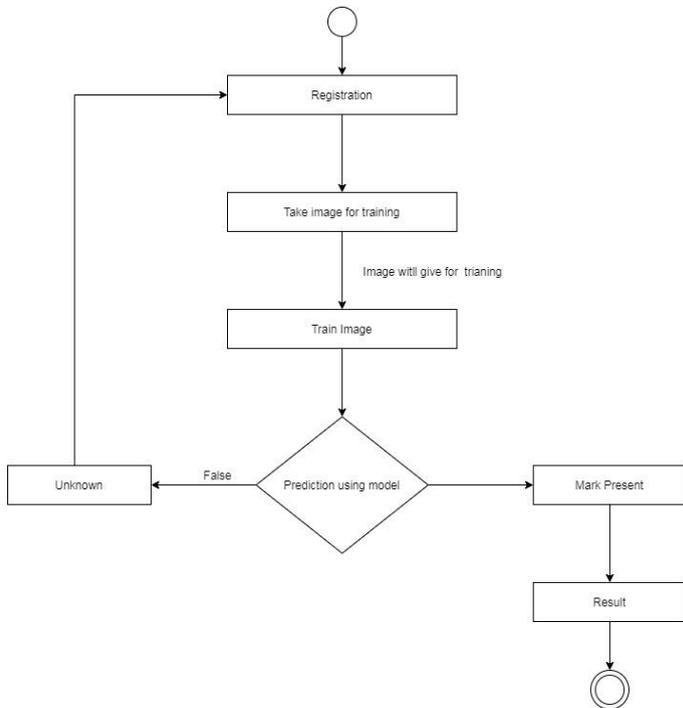
STEP 2: Keep the camera where every student are visible to camera.

STEP 3: If student face are recognized, students are going to be marked as present. Else Visit step 2, for the registration process.

STEP 4: If the student face is recognized that student is going to be considered as absent

STEP 5: Which all aren't recognized by camera them be consider as absent.

STEP 6: End.



II. IMPLEMENTATION

Step 1

Start your application by running main.py file ,there will be options for registration, take image, train image, track image.



Step 3

When user click on take image button to take image:

1. It will open camera window then it will take image from camera and saving it in a separate folder



Step 4

After the completion of taking it will notify to the user your image saved for id and name.



Step 5

In this process the user click on the trained image it's notifies the user image trained with particular person respectively.

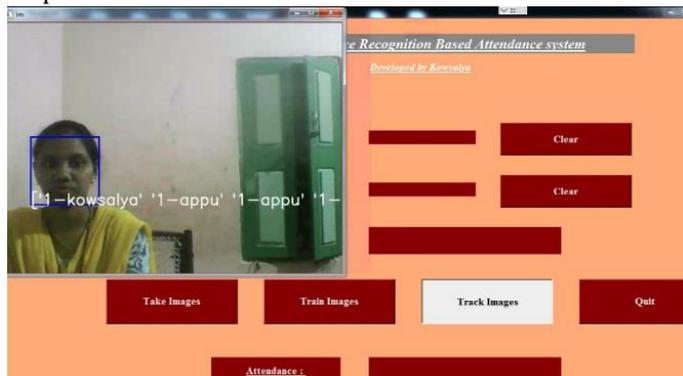


Training image

Step 6

When user clicks on track image button, it will open window for face recognition.

Step 7

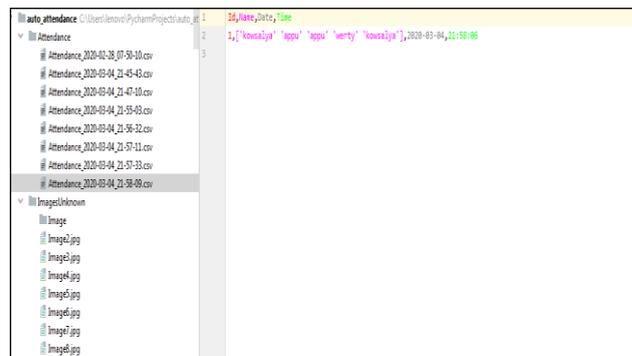


Final it will show the predicted person attendance.



Step 8

Output of the prediction



III. CONCLUSION

Automated attendance monitoring system was chosen by us by keeping in view of the demands of day to day needs and wants of the society. Education is the most important thing which every person should acquire as it is the basis for a better lifestyle and will surely alleviate the standard of a living community. What our education system lacks is the involvement of students in the schools, colleges and universities. Instead of attending lectures and studying they prefer staying away from class and keep engaged in using these gadgets. Low attendance means that the students and not there to acquire the knowledge which they are supposed get and is of immense importance for them and can lead them to a better future.

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