Automated Attendance System Project Using Face Recognition

Project report in partial fulfilment of the requirement for the award of the degree of

Bachelor of Technology

In

Computer Science & Information Technology

Computer Science & Technology

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CERTIFICATE

This is to certify that the project titled **Automated Attendance System Project Using Face Recognition**

submitted by Shivsundar Bera **(University Roll No.** 12021002023003**),** Hriteesha Pramanik **(University Roll No.** 12021002022005**)**, Arindam Roy **(University Roll No.** 12021002022116**),** Soumyajit Patra **(University Roll No.** 12021002022004**)**, Sayandeep Mondal **(University Roll No.** 12021002023071**) and** Swarnadeep Roy **(University Roll No.** 12021002022061**)** students of UNIVERSITY OF ENGINEERING & MANAGEMENT, KOLKATA, in partial fulfilment of requirement for the degree of Bachelor of Computer Science and Information Technology/Computer Science and Technology, is a bona fide work carried out by them under the supervision and guidance of Prof. (Dr.) Anirban Chakraborty & Prof. (Dr.) Srilekha Mukherjee during 3rd Semester of academic session of 2022 - 2023. The content of this report has not been submitted to any other university or institute. I am glad to inform that the work is entirely original and its performance is found to be quite satisfactory.

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Signature of Guide Signature of Guide

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Signature of Head of the Department

ACKNOWLEDGEMENT

We would like to take this opportunity to thank everyone whose cooperation and encouragement throughout the ongoing course of this project remains invaluable to us.

We are sincerely grateful to our guide Prof. (Dr.) Anirban Chakraborty and Prof. (Dr.) Srilekha Mukherjee of the Department of CST/CSIT, UEM, Kolkata, for his wisdom, guidance and inspiration that helped us to go through with this project and take it to where it stands now.

Last but not the least, we would like to extend our warm regards to our families and peers who have kept supporting us and always had faith in our work.

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ABSTRACT

The management of the attendance can be a great burden on the teachers if it is done by hand. To resolve this problem, smart and auto attendance management system is being utilized. By utilizing this framework, the problem of proxies and students being marked present even though they are not physically present can easily be solved. This system marks the attendance using live video stream. The frames are extracted from video using OpenCV. The main implementation steps used in this type of system are face detection and recognizing the detected face, for which face-recognition library using dlib is used. After these, the connection of recognized faces ought to be conceivable by comparing with the database containing students' faces. This model will be a successful technique to manage the attendance of students.

1.INTRODUCTION

1.1 PROJECT DEFINITION

Design of an automatic class attendance system using face detection algorithm of LabVIEW software. The system requires a video capture device and the running LabVIEW algorithm to be implemented successfully. It detects the faces and mark attendance accordingly. This system will prevent unnecessary wastage of time of classes that is usually wasted in form of class roll calls.

1.2 PROJECT OBJECTIVES

1. Reducing time wastage during conventional class attendance.

2. Utilizing latest trends in machine vision to implement a feasible solution for class attendance system.

3. Automating the whole process so that we have digital environment.

4. Preventing fake roll calls as one to one attendance marking is possible only.

5. Encouraging the use of technology in daily lives

2.LITERATURE SURVEY

Traditionally attendance was taken manually which is very time consuming and often leads to human error. Additionally, there are many uncertainties towards the sources of the attendance records which in fact, most of the attendance records are not retrieved from the actual situation. The old method that uses paper sheets for taking student's attendance can no longer be used. Based on the research, there are many solutions that are available to solve this issue.

3.PROBLEM STATEMENT

According to the previous attendance management system, the accuracy of the data collected is the biggest issue. This is because the attendance might not be recorded personally by the original person, in another word, the attendance of a particular person can be taken by a third party without the realization of the institution which violates the accuracy of the data. For example, student A is lazy to attend a particular class, so student B helped him/her to sign for the attendance which in fact student A didn't attend the class, but the system overlooked this matter due to no enforcement practiced. Supposing the institution establish an enforcement, it might need to waste a lot of human resource and time which in turn will not be practical at all. Thus, all the recorded attendance in the previous system is not reliable for analysis usage. The second problem of the previous system is where it is too time consuming. Assuming the time taken for a student to sign

his/her attendance on a 3-4 paged name list is approximately 1 minute. In 1 hour, only approximately 60 students can sign their attendance which is obviously inefficient and time consuming. The third issue is with the accessibility of those information by the legitimate concerned party. For an example, most of the parents are very concerned to track their child's actual whereabouts to ensure their kid really attend the classes in college/school. However in the previous system, there are no ways for the parents to access such information. Therefore, an evolution is needed to be done to the previous system to improve efficiency, data accuracy and provides accessibility to the information for those legitimate parties.

4.PROPOSED SOLUTION

The task of the proposed system is to capture the face of each student and to store it in the database for their attendance. The face of the student needs to be captured in such a manner that all the feature of the students' face needs to be detected. There is no need for the teacher to manually take attendance in the class because the system records a video and through further processing steps the face is being recognized and the attendance database is updated. This system is developed using Python OpenCV.

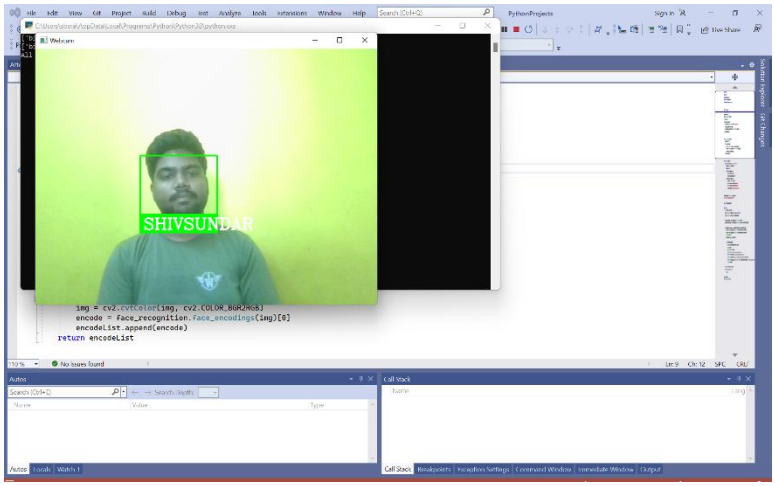
OpenCV: OpenCV (Open Source Computer Vision Library) is a library of programming functions mainly aimed at real-time computer vision. Originally developed by Intel, it was later supported by Willow Garage then It seez (which was later acquired by Intel). The library is cross platform and free for use under the open-source BSD license. Python is dynamically typed and garbage collected. It supports multiple programming paradigms, including structured (particularly, procedural), object-oriented, and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library.

Image Capture: We need some HD camera in order to get results. We can capture the images from the video stream or by capturing each and every image from the webcam manually. Doing the frame capture from the stream of video will give us results in less individual cortical neurons respond to stimuli only in a restricted region of the visual field known as the receptive field. The receptive fields of different neurons partially overlap such that they cover the entire visual field. CNNs use relatively little pre-processing compared to other image classification algorithms. This means that the network learns the filters that in traditional algorithms were hand engineered. This independence from prior knowledge and human effort in feature design is a major advantage.

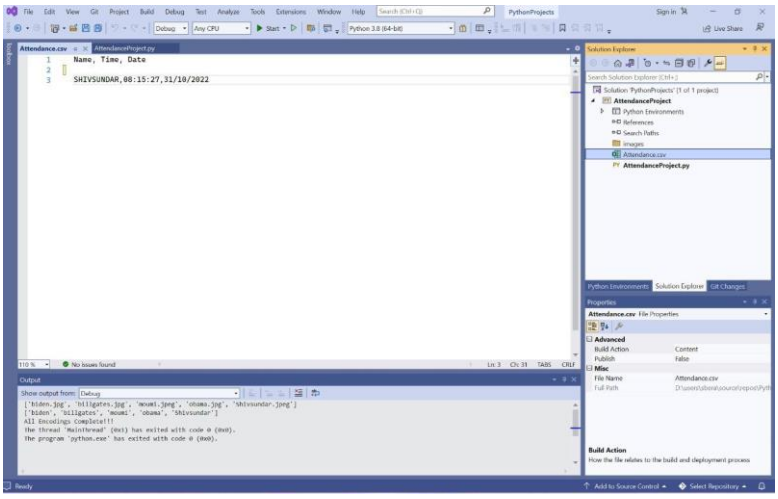
5.EXPERIMENTAL SETUP & RESULT ANALYSIS

First in all we need to register the person into the database. To do so, we need to give name and his/her registered number to store.

Now we to get the pictures of the persons from the webcam or any other cams available like we used laptop webcam here. Select the cam from which we need to take the image and start the camera. The camera is plotted in the axes and we can capture and save the images in the folder created automatically with the registered number we have entered. After this the data is stored in the database. Now we capture a picture from the webcam and see the results. The camera starts and takes the image to give the results checking from the saved database.



Capturing and Matching the Image



Update Attendance File

6.CONCLUSION & FUTURE SCOPE

Capturing the images from camera or cc camera and applying techniques face detection and recognition can decrease the manual work from human and increase the security safety, taking the decision from this recognition result. Based on this face detection and recognition can be used in implementing so many applications like automatic attendances system based on face recognition, worker attendances, security, safety, police application like finding a thief in an image that helps to catching thief. In this system we have implemented an attendance system for a lecture, section or laboratory by which a lecturer or a teaching assistant records student's attendance. It saves time and effort, especially if it is a lecture with huge number of students. This attendance system shows the use of facial recognition techniques for the purpose of student attendance and for the further process this record of student can be used in exam related issues.

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