

Attendance using Facial Recognition

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Abstract—Whenever it comes to attendance, the two best biometrics are face and fingerprint. They are the most unique in a human being. The security and accuracy are also maintained as for marking the attendance the person himself/herself has to be present. But as far as time factor is concerned the facial recognition takes an edge over fingerprint. One of the most important as well as demanding is attendance marking in any school, college or any organization where group of people work. However, the traditional techniques of calling out the name and manually marking the attendance are time consuming and tedious. This particular project has been designed and implemented aiming eliminating all above concerns. The help of open-CV technology has been taken. A face recognition module has been created and also locating the face landmarks and encoding the image data provided is also part of initial part of designing. Webcam has been used to capture images.

Keywords—Attendance, biometric, face, image, module, open-CV.

Literature Review

This attendance system is in position where in the teachers in schools/colleges or admins at any other organizations can efficiently take the attendance using face recognition. This system can be a perfect substitute for fingerprint based biometric systems which will help in saving lot of time.

I. INTRODUCTION

Attendance using the traditional attendance system has now become a major concern as the faculty in schools, colleges or any other person taking the attendance in any organization have to spend a lot of time on taking attendance and marking the attendance manually becomes a tedious task. Having modern attendance systems help a lot in saving the time as well as bringing efficiency in process of attendance. Maintaining attendance record is a significant function in all the institutions/organizations to monitor the performance of the students as well as employee. Every school/college does this in their own way. Attendance using facial recognition system is a computer-based biometric software which is aimed for determining or validating a person by making comparison on patterns based on their facial appearances. Face recognition systems have upgraded significantly in their management over the years and this technology is now vastly used for fulfilling various concerns like security and also commercial operations. Face recognition is a powerful field of research which is a computerized digital technology which full-fill lots and lots of objectives. This system is widely used in various security systems and it can be compared with other biometrics such as fingerprint or eye iris recognition systems. The iris recognition systems are much complicated though they fulfill all the objectives which are fulfilled by facial recognition. The biometric system requires a queue for marking the attendance which is time consuming. Today the intake of no. of students in colleges and no. of employees at an organization is increasing year by year. This particular system will be helpful for the explanation of these types of problems. To develop a useful and applicable Real-time Face recognition system there are

several parts which are taken to be care of. For recognition the registration of person in system is must. Admin has the access over all the data.

II. METHODOLOGY/EXPERIMENTAL

A. Materials/Components

1)OpenCV: Open-CV is a great tool for image processing and performing computer vision tasks. It is an open-source library that can be used to perform tasks like face detection, object tracking and much more. It supports multiple languages like java, C++, python. The library is equipped with 100s of useful functions and algorithms, which are freely available to us. Tools like open-CV helps us to explore the solutions to real life problems.

2)PyCharm:

Following libraries are used-a)C-Make-Make is an open-source, cross-platform

tool that uses compiler and platform independent configuration files to generate native build tool files specific to your compiler and platform. The C-Make Tools extension integrates Visual Studio Code and C-Make to make it easy to configure, build, and debug your C++ project.

b] D-lib (19.18.0)-It's a landmark's facial detector with pre-trained models, the d-lib is used to estimate the location of 68 coordinates (x, y) that map the facial points on a person's face.

c]Face-recognition-You can import the face recognition module and then easily manipulate. faces with just a couple of lines of code. Automatically find all the faces in an image. Automatically locate the

facial features of a person in an image. Recognize faces in images and identify who they are.

d]NumPy- NumPy is a Python library used for working with arrays.

3)Visual Studio Code

4)External webcam

III. RESULTS AND DISCUSSIONS

Importing and displaying test image and normal image, normal image will be used for encoding. The faces will be found in image and their encodings will be found as well. Comparing the two faces with the help of encodings results will give a Boolean value.

IV. FUTURE SCOPE

The scope of AI and ML based solutions for solving day to day problems is vast. In future the facial recognition module can be made faster by applying media-pipe to the already existing facial recognition library which can then be integrated to a self-managed Integrated Circuit which will greatly reduce its cost and maintenance. In near future an all-interconnected network of security cameras with IOT can be used to spread the present use case to a wide area of implementation covering national security to moral life.

The major disadvantage of this system is 2D image altering, so this problem can be solved by using an algorithm which is capable of creating a 3D mesh to validate the person's Id to avoid misuse. Some algorithms to explore are Face Mesh, an Open-Source module by google.

V. CONCLUSION

This attendance system will solve all the issues faced by the past traditional attendance system, whether the efficiency issues or time constraints. Various modules and functions of Open-CV are used. The better will be the webcam quality, better will be the results, in the sense the amount of people recognized by the system will be more which will make sure more time is saved. The admin can decide whom to give the access of attendance. It is made sure that the accuracy is maintained in the process.

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