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Face Recognition Attendance System and Mask Detection

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ABSTRACT:- We have bring up with this project because of the current situation all people wears mask and it difficult to identify the person for attendance for that we have one solution that is cascade classifier solves the raised problem in students during the pandemic situation of covid -19 and for that face recognition is a powerful tool for a biometric system that takes data from both images and videos.

The first approach follows some parts which are face detection, pre-processing training and facial recognition, through which attendance will be recorded and sent to the appropriate tec and mask detection play a vital role in the technical field of security. Face detection and mask masking is very important in the current pandemic situation.

KEYWORDS:- OpenCV, Flask, HAAR cascade.

I. INTRODUCTION

The main watchword of this project is to obtain the presence of a pupil without calling him or without saying his name in the classroom. We know how the covid-19 has shown its power in the last years and even now there are still variants that are growing up and these variants are also called covid-19 children because they come from the corona virus only it spreads by touching another person physically or touching the same things as those affected by another person mainly in the classroom this can happen in many situations we know that attendance in the book register and it is touched by open then by teacher then sometimes it may also be touched by students during break time. So there are many chances to be affected by corona virus to overcome this problem. We can use this project which take or record attendance by face recognition of student this can be done using an openCV but due to this pandemic situation everyone is using masks for this also we have openCV. Everyone uses masks for that too we have OpenCv.

II. OPEN CV (COMPUTER VISION)

OpenCv Artificial intelligence, Machine learning, face recognition etc,. It is a python open source library used for computer vision in fields. In OpenCV is an abbreviation for computer vision and is defined as a field of study. It helps computer understand the content of digital images such as photos and videos. An object a text description and a three-dimensional model etc. Extracts the description from the pictures that can be.

Object Classification – When classifying objects, we train the model on a dataset of specific objects and the model classifies the new objects as belonging to one or more of your training categories.

Object Identification – Our model will identify a specific instance of an object in the object identification phase.



Fig.1: Identification Method in OpenCV

The pixel value is utilized to turn images into numbers, hence the answer is yes. The smallest unit of a digital picture or graphics that may be displayed and represented on a digital display device is the pixel. The pixel values for a grayscale image are shown in the figure above as a single number representing the intensity of the black colour at the place.

1. Grayscale
2. RGB

III. FLASK

Flask is a web framework that provides libraries to build lightweight web applications in python. It is developed by armin ronacher who leads an international group of python enthusiasts. Flask is considered as a micro framework.



Fig.2: Face Recognition using OpenCv in Flask

IV. HAAR CASCADE

The HAAR CASCADE algorithm is one of the most powerful object detection algorithms specifically for face detection in OpenCV designed by Michael Jones and Paul Viola in their research work entitled “Rapid Object Detection using a Boosted Cascade of simple Features” and was designed in 2001 which uses a function called the cascade function to detect objects in the image and many negative images and positive images are used to train this cascade function and this cascade function returns an image with rectangles drawn around the faces in the image as output. The subtraction of these two sums results in the extracted flag value. There are three types of haar elements extracted using the cascade Haar algorithm: edge elements line elements and elements surrounding the center. In order to detect the faces in the image we load a pre-trained XML classifier file. The position of the detected faces is returned using the MultiScale detection function. Then an area of interest is drawn around the detected faces in the image.

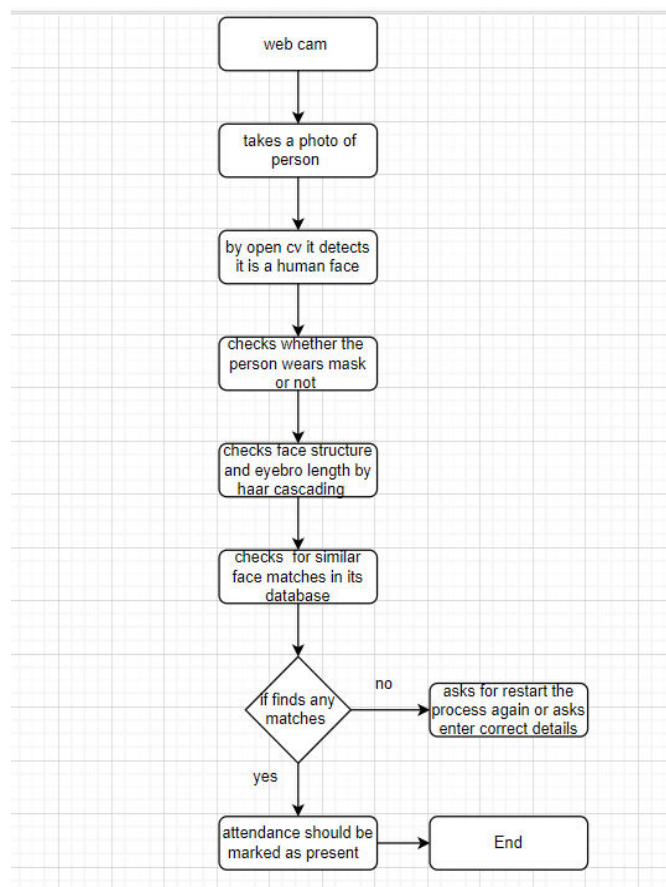


Fig.3: HAAR Cascade classifier Algorithm

For Attendance and mask detection:-

We know how important attendance is in our lives and it impacts in many ways as in schools and colleges and in workplaces as well as attendance and attendance describes how one regularly goes or attends a place or activity.

Here attendance should be marked by facial recognition and depending on the current situation each person wears a mask for security reasons or protects against a harmful virus, but this mask makes it difficult to identify a specific person in the mask and in the biometric system face attendance process we face certain problems if a person wears a mask. So we can overcome this problem using the cascade algorithm haar we know how it works detects the face by calculating the face structure and length of eye shots of a particular person and finds similar faces in the databases of

this system. If they agree they shall provide details of the person.

V. METHODOLOGY

As we all know , Python is the general programming language with unlimited advantages and user friendly syntax code. Even also you can write your paper now in a variety of notebooks and then put it as resources work. Our project which is based on image processing for the attendance system is above all integrated with open computer vision which gives enormous power to the concept.

When a person approaches the webcam it captures that person’s face and by open cv it says it’s a human face then by haar cascade we know its detecting the face and when a person with a mask or without a mask detects it by calculating the length and structure of a person’s face and if a person wears a mask, it calculates the length of that person’s face by the structure of the face and by the eye length after it checks where the detected face matches the database having in the system and if it matches the data then the presence of that person should be marked as present.

Here some of the python packages/modules using in the project are:-

1. Numpy – Scientific computing, path of multidimensional array object, linear algebra, and fourier transform are all included in this library.
2. Tkinter – python’s built in library for creating interactive simple GUI programmes, text, editors, games and other things.
3. OpenCV – High-level understanding, task automation and recognition are all included in this library.
4. PIL – Image manipulation and python reflection codes are handled by this package.

In our project we basically use OpenCV which is a high level of understanding task automation and situation recognition that are used to write other types of programs that use tools like flask.

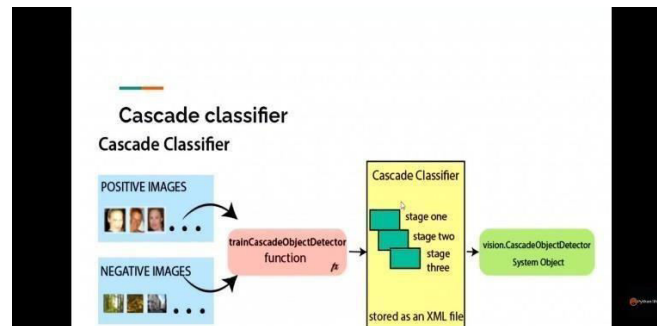


Fig.4: Flow chart of Attendance system

The data in the system should be secure and the marked attendance should be maintained in excel sheets and saved according to working dates so that we may verify attendance for a specific date. The excel sheet should not be altered in the future.

VI. RESULT

By implementing this project in the real world, we may accomplish a variety of goals such as having instructions take attendance without the use of a proxy, which can save time. This will be advantages in any university where there is an attendance concern. Students would be unable to mark attendance for their friends and vice versa as a result of this. This will benefit professors as well as it will save them time and eliminate the need to take a head count of students present simply to double check whether any of them have indicated proxy attendance or not. The ecosystem of schools and colleges will be developed as a result of this initiative, and technology will circle around it.

VII. CONCLUSION

The Automated Attendance System was created to address the flaws in the traditional manual frameworks used in schools and universities. The use of picture handling mechanisms in homeroom is demonstrated in this participation framework. This framework can not only aid in the participation framework, but it can also boost an organization's generosity and significantly reduce time and paper waste.

FUTURE SCOPE

We're only getting started on the building of a larger foundation, which will include two distinct modules. The portable element of the primary module, face locator, is essentially a digital camera application that captures under recognized faces or stores them in a document using a personal computer vision face discovery computation and frame extraction approach. The following modules are work area programme that recognizes the captured specific photographs of face in the record, denotes the understudies register, and then stores the outcomes in a datasets for future analysis.

No student will be able to give or mark fraudulent attendance for his or her buddies using this programme. Because appropriate attendance will be recorded on an excel sheet, it will save time for faculty in institutions who have a lot more work to complete than waste time taking attendance of students in class. Another change we did was to connect the project to a server and link it to the parent email id so that we can send the students monthly attendance report to their parents through email so that they can keep track of their development.

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