ATTENDANCE UPDATION BY MONITORING COVID-19 PROTOCOLS

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Abstract:

Masking up, social distancing and sanitizing are the new normal that everyone has adopted to during the corona virus pandemic. It changed our lives in every aspect. Not only medical negligence but also personal negligence costs a life. Monitoring each and every person whether they are following the COVID-19 guidelines is a challenging task. The main cause of spread of the virus is the social gatherings like family gatherings, events, schools, colleges, educational institutions and offices. The children and youth are the major carriers and transmitters of the disease. They are less affected but may lead to further spread. We want to restrict the spread of the disease by digitally monitoring whether the people are wearing the masks properly or not. Also, we send automatic alert mails to the concerned authorities and the particular person who is violating COVID-19 norms. In this way, we can easily identify the people who are violating the norms and can take corrective actions against them. Here we post the attendance to the students only if they wear the mask.

Keywords: Attendance, Face detection, haarcascade classifier, Convolution neural networks, MobileNet, Tkinter, smtplib

I. Introduction:

Health is the top most priority for each and everyone. Corona has brought many changes in our day-to-day life. The much-noted symptoms of corona virus are high body temperature, weakness, cough, anosmia and ageusia. Since the pandemic started about a 6 million people

have been succumbed and about half a billion people were affected adversely. The people who survived the disease also had severe side effects like loss of vision, shortness of breath, etc. Along with the medical support, it is the responsibility of all the individuals to stop the continuity of the disease by wearing masks in public places, sanitizing regularly and maintain social distance.

Attendance indicates the number of people present at a particular event or gathering. Attendance is one of the key features of discipline. Attendance is important in educational institutions to have regularity and provide better understanding of the subject. It has immense importance in organisations to uphold productivity. From the past decades attendance was being recorded manually which takes a lot of time and effort. Later the biometric attendance system was introduced which uses a person's finger print to identify and mark attendance. In this present modern world, automation plays a major role in improving the accuracy and reduces the labour. The face recognition in machine learning has enabled us to automatically record the attendance. Automatic attendance system is an advancement to the traditional attendance system. By using face recognition with the help of automatic attendance system we ensure authentication and prevents the false participation of an individual. It also ensures verification of an individual who is wearing and not wearing the mask.

II. Literature review

Manually taking the attendance has become a layman method. There are many attendance systems that have been proposed based on biometrics, iris detection and face detection. All of these approaches are used to achieve the common goal of recording the attendance. The face recognition attendance system was implemented using python. In the early 2000s, the local based features were used for face detection. Now a days a wide variety of algorithms are being used and are implemented by using the OpenCV library. The face detection based on the Eigen faces techniques for attendance system was proposed by Mohd Hanafi Ahmad Hijazi. In this approach, the faces are compared by using the Eigen faces and local patterns. This algorithm is very efficient and less time consuming. There are some other face detection attendance systems based on deep learning which includes the systems like DeepFace, FaceNet, etc. In these approaches the important points from the images are extracted and these points are known as feature points. Here images need to be trained to be detected.

The face mask detection can be implemented by using several models in convolution neural networks of deep learning. One such model is by using keras, TensorFlow and OpenCV. It is implemented in two phases. They are training and implementation. In training we have different steps like loading the face mask dataset, training the face mask classifier and serialize the face mask classifier to the disk. The implementation involves the steps like loading the face mask classifier from the disk, identifying the faces in the live video streaming, extract each of the face region of interest, apply the face mask classifier to each of the face ROI and should be able to determine whether the face is with mask or without mask and finally produce the output. The detection of face mask by using keras, TensorFlow and OpenCV produces an accuracy of 92%.

III. Flowchart of existing system
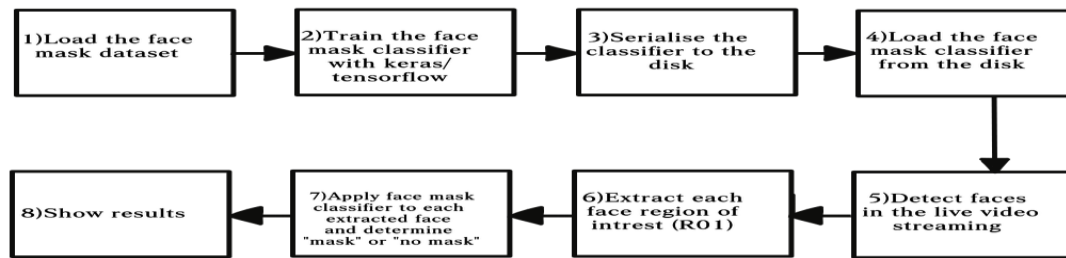
IV. Methodology
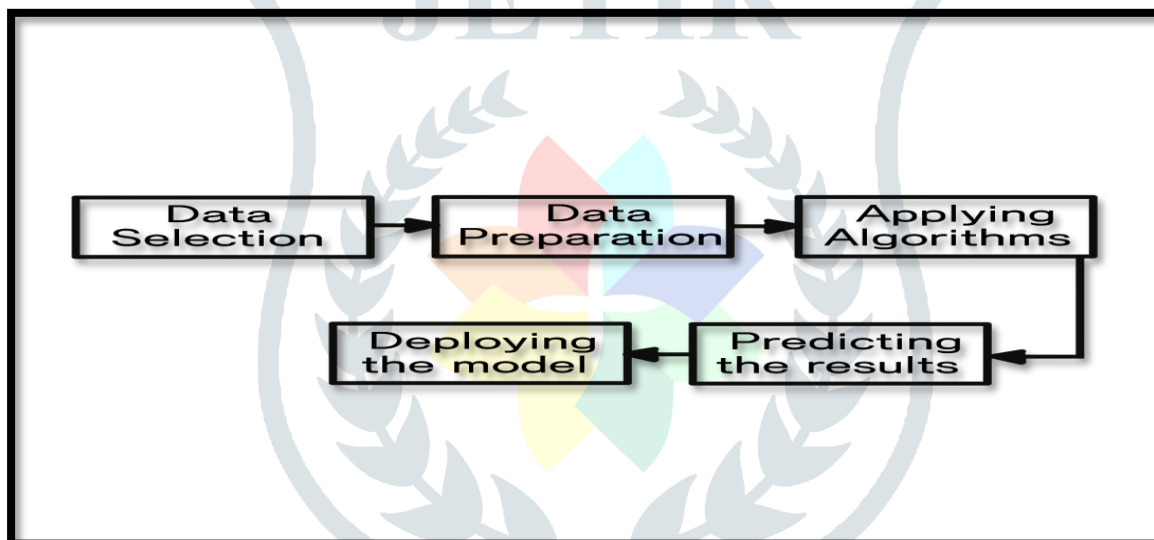
A. Data Selection

In data selection, all the data that is required to execute the system are collected from different sources. We have collected the face mask data from https://data-flair.s3.ap-south-1.amazonaws.com/Data-Science-Data/face-mask-dataset.zip which consists of people with and without mask.

B. Data Preparation

In data preparation, we try to convert the images of the dataset into grayscale images and then normalize them for better comparisons.

C. Applying Algorithms

To identify the students who are following the COVID-19 protocols by wearing the mask, we use convolution neural networks. The CNN is preferred to be used over other models as it has a feature of extracting the most relevant features from the given images and it does not require more extensive data pre-processing. The convolution neural networks provide extensive training of the model as the training data is sent through a number of layers. The CNN consists of three layers. The convolution layer helps us in extracting the features of the faces from the camera. The next layer is the ReLu layer, helps in increasing the non-

linearity among the faces detected. The pooling layer is used to reduce the number of features that has to be compared.

MobileNet a baseline model of convolution neural network is used to implement face mask detection. It is preferred as it requires a minimum number of inputs and produces effective output. By using MobileNet we can achieve 99% accuracy in detecting a face mask.

D. Predicting Results

The results are being predicted by first monitoring whether a particular student is wearing mask or not. If the student is wearing the mask and present in the class then he/she will be marked as present automatically by using face recognition. Otherwise, that student will be marked as absent. When a particular student is being identified as not wearing mask, then an alert mail will be sent to the concerned authority and as well as to the respective student. After taking the attendance, the absentees list is sent in the form of a mail to the concerned authority.

E. Deploying Model

The attendance updation by monitoring COVID-19 protocols is deployed by using Tkinter which is a python graphical user interface.
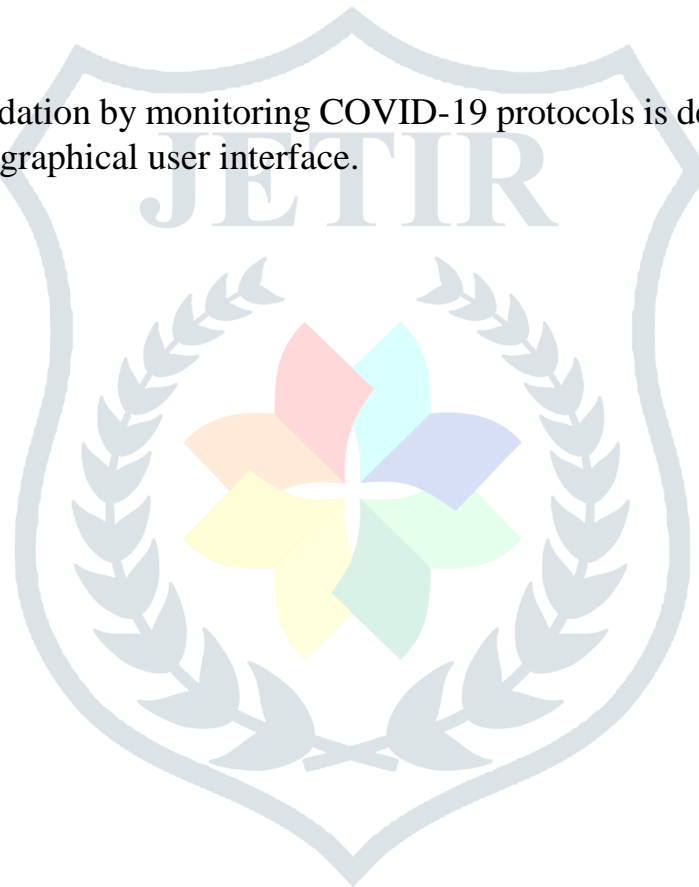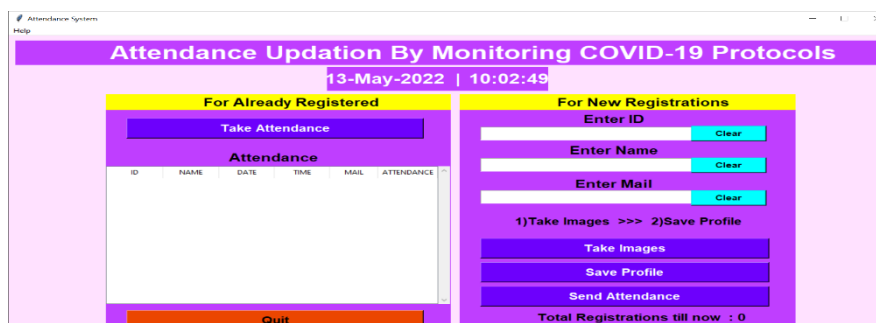
V. Flow cart of proposed system
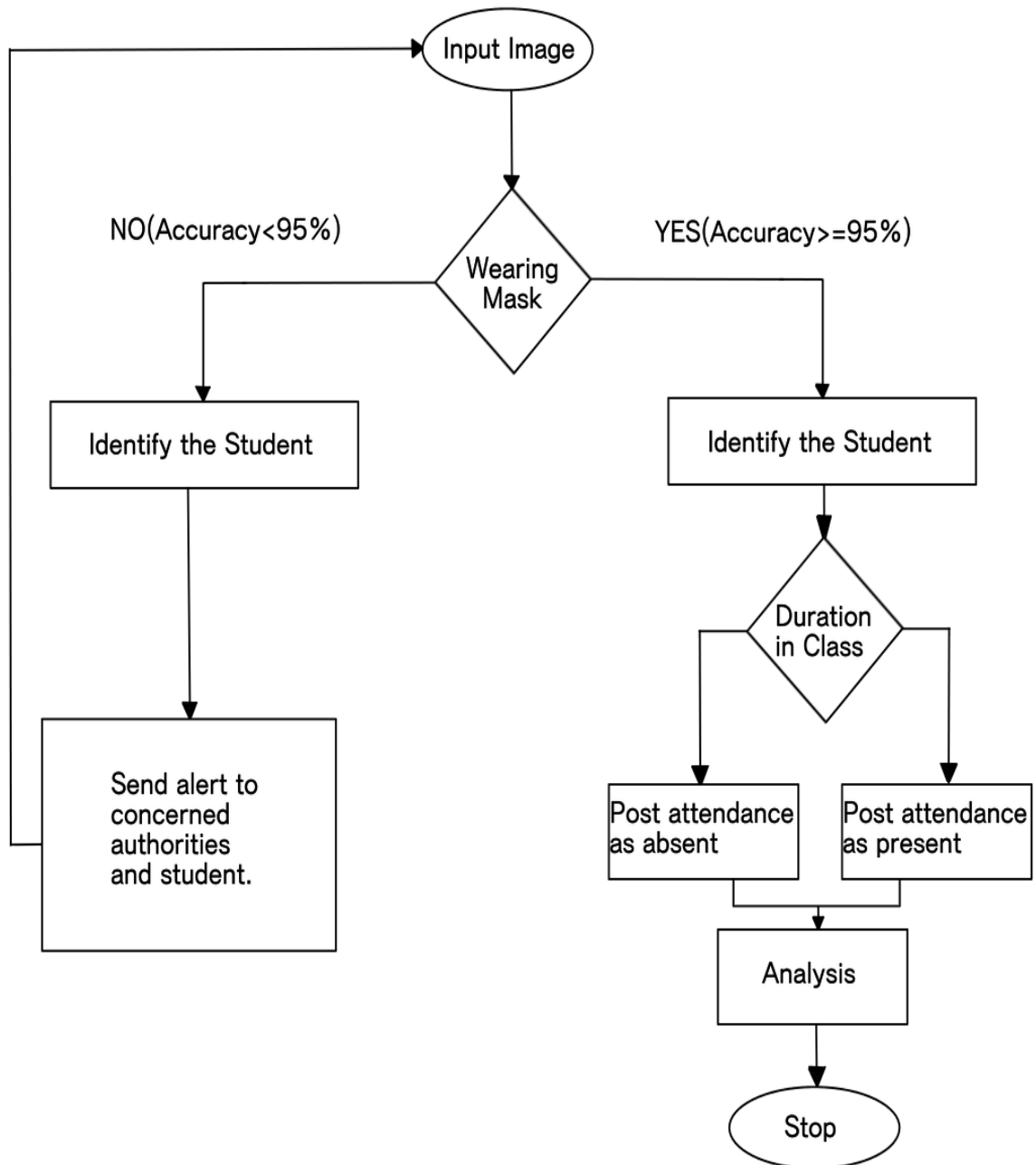
VI. Results

A. Graphical user interface

The Tkinter graphical user interface is used for updating attendance and monitoring whether the students are following COVID-19 protocols or not. It is divided into two frames. The right frame is used to fetch the details of the student like student id, student name and student Gmail id. Here we also have several options like "Take Images", "Save Profile" and "Send Attendance". In the left frame, the attendance details are displayed.

B. New registration
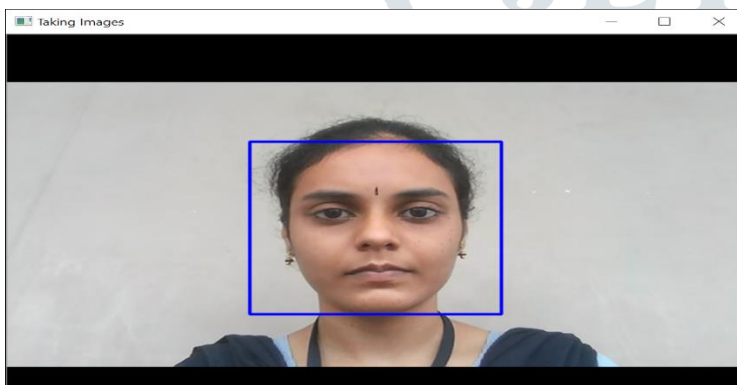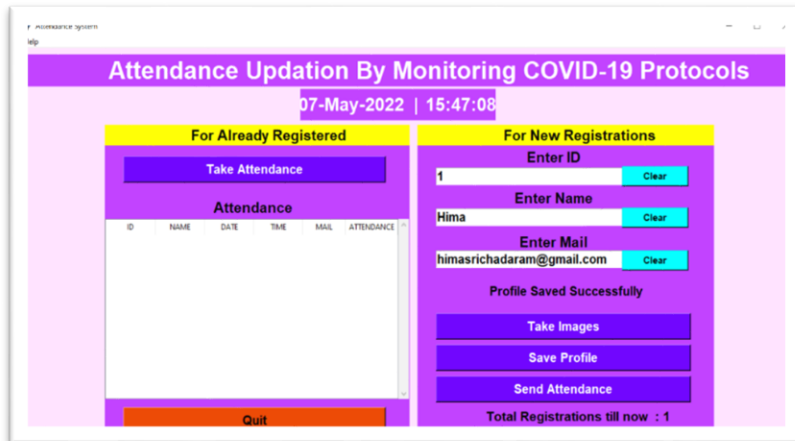
For entering details of a new student, we need to enter the student id, name and their Gmail id. Then we need to capture the student's face images by clicking on "Take Images" and we save their profile by clicking on "Save Profile" and entering the password.

C. Identifying faces and taking attendance
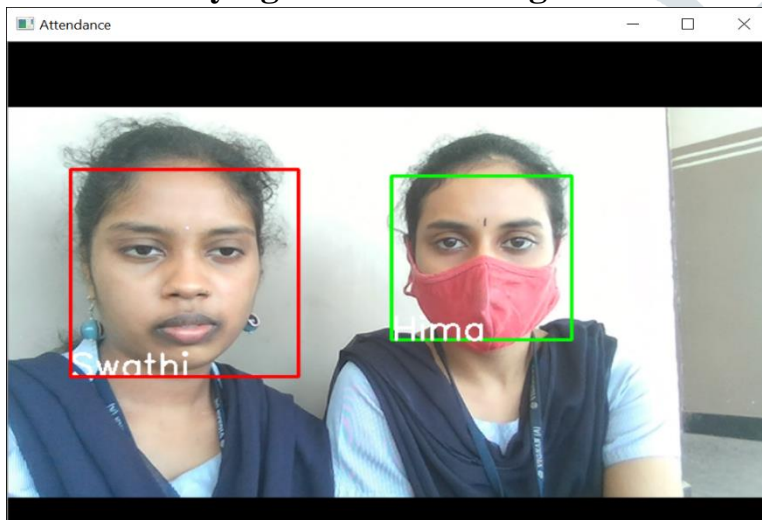
To take attendance, we need to click on "Take Attendance" then the camera will open and will identify the students in the class. The students who are wearing the mask will be shown in green

rectangle box and for that particular student the attendance is marked as present. The students who are not wearing the mask will be displayed in a red rectangular box and for that particular student an alert is sent to their mail to wear the mask.

D. Displaying attendance

Here after taking the attendance, the attendance will be displayed along with the student details.

E. Sending alert messages to student

An alert message is sent to the student to wear mask.

F. Sending alert messages to admin

G. Sending attendance to admin

Alert!!!   Inbox ×

chadaramhimasri@gmail.com
to bcc: me ▾

Dear admin, The following students are absent

['Sravanthi', 'Swathi', 'Tanvi', 'NAME']
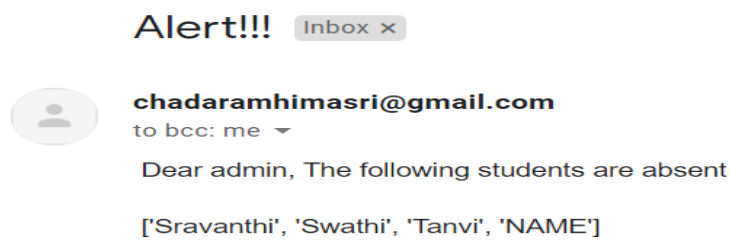
An alert message is sent to the admin, which consists of all the students who are not present in the class (absent).

VII. Conclusion

We can conclude that by using attendance updation by monitoring COVID-19 protocols system, we can post the attendance to all the students who are present in the class by wearing the mask properly. Also, an alert mail will be sent to the concerned authorities and the respective students who are violating the protocols. The attendance analysis is also sent to the admin. In this way, we can use this system to mark attendance and monitor the COVID-19 protocols during the pandemic. By using this system, in the future we can send results of the students to parents. This model can also be used in organisations to monitor the employees and track their punctuality and performance.

VIII. Acknowledgement

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