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Human Face with Mask Detection and Recognition for Smart Attendance System in a Pandemic Scenario

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Abstract
Face recognition and detection has vital role in the technical field especially in the field of security In this paper we see how to detect the face with mask and detected face is recognized and marked the attendance smartly. Face with mask detection and recognition is now very important in current pandemic situation.In pandemic to continue the service ,educationwith stress free and easily this approach is very useful.
Keywords: *Open cv ,Python ,Deep learning*

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I. INTRODUCTION

Covid 19 in india was reported on 30 jan 2020 which originated from china After a few month the virus was hit by global outbreak in 2020.on may 2020 WHO declared the situation as the pandemic. Millions of people infected due to the virus. With the growing trend of patient there is still no effective cure or available treatment for the virus. several organisation and researchers are working to produced vaccine for the deadly virus but till date no success is reported therefore to spread the virus precautions are taken by the whole world to reduce the flow of virus many researchers continuously work on it. All organization such as educational and financial background suffering many problems to manage all work so they have an option to work with this situation with the help of many such innovations .out of that innovation one of our reserch is face mask attendance system, and so covering our face with mask has become new normal amidst the pandemic as face mask are effective in preventing the virus out break. Other precautionary measure are also advocated by government to maintain safety and hygiene. Face recognition is the most feasible option in the current situation an Amid the global crisis new demand has emerged in the market and that is face with mask detection and recognition and marking the attendance in real time using open CV is a popular computer vision library started by Intel in 1999. The Open CV 2.3.1 now comes with a programming interface using c++, Python and Android. This paper's main moto is to achieve better accuracy in the detection of face using deep learning and programmed in python.

II. LITRATURE AND REVIEW

In recent years a number of face recognition and detection introduced in many organisation such as service sector ,health and education. From the review of related work we found that many researchers had work done in raspberry pi based image processing .different papers of raspberry pi gives an idea about project implementation of raspberry pi based face detection and Face recognition is an easy task for humans. The refrences used here is as

1]Face recognition in real time for smart attendance system: The purpose of these research is to implement and devloap face recognition algorithm and the researcher is shubhankar Sharma,tanushree gupta and resheek kumar.The methodology includes systametic approach of face detection,feature extraction,comparison with database and output generation.

2]Implementation of smart attendance system using raspberry Pi:The purpose of these system is to provide the attendences system using face detection and recognition on Rspberry pi board and send an alert message to the authorised personvia mobile device or internet server and work in real time with low false detection rate these described by rupali rumane in her research here.

3]Robust real time obect detection by Paul viola and Michael jones This paper describes a visual object detection framework that is capable of processing images extremely rapidly while achiving high detection rates including three contribution firstintroduction of new image representation called integral image which allows the features used by detector to be computed very quickly.second is learning algorithm based on

adaboost which select small number of critical visual featuresand yields extremely efficient classifier and the third contribution in this is cascade allows background regions of the image to be quickly discarded.

4]Face detection techniques:

Authors describes here face detection is a computer technology that determines the location and size of a human face in the digital image. The facial features are detected and any other objects like trees and bodies are ignored from the digital image. It can be regarded as a specific caseof object-class detection, where the task is finding the location and sizes of all objects inan image that belongs to a given class. Face detection, can be seen as a more general case of face localization. In face localization, the task is to identify the locations and sizes of a known number of faces usually one. Basically, there are two types of approaches to detect facial part in the given digital image i.e. feature based and image based approach. Feature based approach tries to extract features of the image and match it against the knowledge ofthe facial features. While image based approach tries to get the best match between trainingand testing images.

In our paper we are using the face with mask face recognition detection for smart attendance system. Objective of our system is to recognize and detect face with mask for attendance which is very effective in a current scenario and that how effective is explain by 4] y cheng that Airborne transmission by droplets and aerosols is important for the spread of viruses. Face masks are a well-established preventive measure The different regimes of virus under plained the variation in mask efficiency.Babudance and reproduction number related to population average infection probability is getting in the variation of mask efficiency. For covid virus the infection present in the individuals can vary by orders of mean environments and contacts are under conditions of low virus abundance (virus-limited) where surgical agnitude. They find that most y different regimes of virus masks are effective at preventing virus spread. More advanced masks and other protective equipment are required in potentially virus-rich indoor environments including medical centers and hospitals. Masks are particularly effective in combination with other preventive measures like ventilation and distancing.

III. METHODOLOGY

Proposed Work and Objective:

Our goal is to train a deep learning model to detect whether a person wearing a mask or not for smart attendance system using open CV,python.and deep learning. We can apply deep learning tecnics if want a classifier that will collect the image of person wearing mask or not. we have used here caffe layer network..The face detection is used to detect faces in the image . If detect faces are multiple all detect face is enclosed by a bounding box and thus we know the location of the faces.Due to variable changes occur in the human faces its difficult to model. for example facial expression, orientation, lighting conditions and partial occlusions such as sunglasses, scarf, mask etc. The result of the detection gives the face location parameters and it could be required in various forms, for instance, a rectangle covering the central part of the face, eye centers or landmarks including eyes,eyebrows ,nostrils,and mouth corners,etc. Almost everyone wears a mask during the COVID-19 corona virus epidemic .Face recognition techniques, the most important means of identification, have nearly failed, which has brought huge dilemmas to authentication applications that rely on face recognition, such as community enorgtry and exit, face access control, face attendance, face gates attain stations, face authentication based mobile payment, face recognition based social security investigation, and all working organization etc.

The face recognizers are all designed based on deep learning, where we used caffe model in this, which depend on massive training dataset1-5.Thus, developing face recognition algorithms for masked faces requires a large number of masked face samples. At present, there is no publicly dataset , and so this work proposes masked face samples.

IV. MODELLING AND ANALYSIS

Two Phase Face Mask Detector

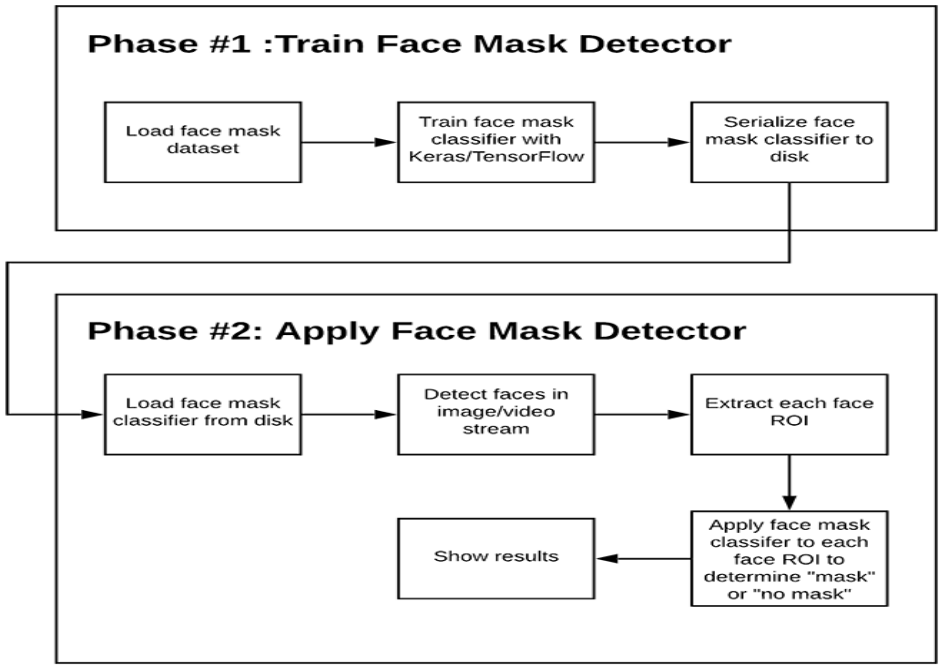

Figure 2: COVID-19 face mask detector with computer vision and deep learning using Python, Open CV

To train a face mask detector, we need to break our project into two different phases, traning the face mask first we'll focus on loading our face mask detection dataset from disk, training a model using Keras flow on this dataset, and then processing of deployment face mask detector to disk: when training of face mask will done. We can then move on to loading the mask detector and once the mask detection done then classifying each face as

With mask or without mask

V. RESULT AND DISCUSSION

We have used python ,open cv and face recognition algorithm in our project. By capturing masked face images train faces compared with database and if valid face is recognized attendance is marked

VI. CONCLUSION

In our system there are two closely related and different applications ,namely ,facial mask detection task and masked face recognition task .Facemask detection task needs to identify whether the person wear a mask. Face Maskd recognition task needs to identify the specific identity of a person with a mask .Each task has different requirements for the dataset. The former only needs masked face image samples, but the latter requires a dataset which contains multiple face images of the same subject with and without a mask relatively,and when valid face is match then the attendance will marked, datasets used for the face recognition task are more difficult to construct.so if the face with mask identified with dataset then the attendance will marked and there is chances of variability in the human face such as expression.

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