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COVID-19 FACE MASK DETECTION

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ABSTRACT

The corona virus covid-19 pandemic is causing a global health crisis so the effective protection methods is wearing a face mask in public areas according to the world health organization (WHO). The covid-19 pandemic forced governments across the world to impose lockdowns to prevent virus transmissions. Reports indicate that wearing facemasks while at work clearly reduces the risk of transmission. We will use the dataset to build a covid-19 face mask detector with computer vision using python, opencv and tensor flow/keras. In our proposed system we will use live video stream to identify when someone not wearing mask. Our goal is to identify whether the person on image/video stream is wearing a face mask or not with the help of computer vision.

Keywords: Python, opencv and tensor flow/ keras.

1.INTRODUCTION

The trend of wearing face masks in public is rising due to the covid- 19 corona virus epidemic all over the world. Before covid-19, people used to wear masks to protect their health from air pollution. While other people are self-conscious about their looks, they hide their emotions in the public to hide their faces. More than five million cases were infected by covid19 in less than 6 months across 188 countries. The virus spreads through close contact and in crowded and overcrowded areas. We can tackle and predict new diseases by the help of new technologies such as artificial intelligence, IOT, big data, and machine learning. In order to better understand infection rates might be decrease through our technique. People are forced by laws to wear face masks in public in many countries. These rules and laws were developed as an action to the exponential growth in cases and deaths in many areas. However, the process of monitoring large groups of people is becoming more difficult in public areas. So we will create an automation process for detecting the faces. Here we introduce a facemask detection model that is based on computer vision and deep learning. The proposed model can be integrated with surveillance cameras to impede the covid-19 transmission by allowing the detection of people who are wearing masks not wearing face masks. The model is integration between deep learning and classical machine learning techniques with open cv, tensor flow and keras. We will achieve the highest accuracy and consume the least time in the process of training and detection.

2.LITERATURE RIVEW

1.Title : “Face mask detector” single shot detector architecture is used for the object detection purpose. In this system face mask detector can be deployed in many areas like shopping malls, airports and other heavy

traffic places to monitor the public and to avoid the spread of the disease by checking who is following basic rules and who is not. It takes excessive time for data loading in google colab notebook. It did not allow the access of webcam which posed a hurdle in testing images and video stream. we have modeled a facemask detector using deep learning. We are processed a system computationally efficient using mobilenetv2 which makes it easier to extract the data sets. We use CNN architecture for better performance. We can fix it in any kind of cameras.

2.Title :"Face detection techniques: a review, "artificial human beings have not tremendous ability to identify different faces than machines, so automatic face detection system plays an important role in face recognition, headpose estimation etc. It has some problems like face occlusion and non-uniform illumination. We use neural network to detect face in the live video stream. Tensor flow is also used in this system. In existing they use adaboost algorithm, we are using mob net CNN architecture model in our proposed system. We will overcome all these problems in this paper.

3.Title : "Multi-stage CNN architecture for face mask detection" this system consists of a dual-stage (CNN)architecture capable of detecting masked and unmasked faces and can be integrated with pre-installed cctv cameras. This will help track safety violations, promote the use of face masks and ensure a safe working environment. Datasets were collected from public domain along with some data scraped from the internet. They use only pretrained datasets for detection. We can use any cameras to detect faces. It will be very useful for society and for peoples to prevent them from virus transmission. Here we use live video detection using open cv (python library).

4.Title : "Real time face mask recognition with alarm system using deep learning" this process gives a precise and speedily results for facemask detection. Raspberry pi based real time face mask recognition that captures the facial image. This system uses the architectural features of vgg-16 as the foundation network for face recognition. Deep learning techniques are applied to construct a classifier that will collect image of a person wearing a face mask and no masks. Our proposed study are uses the architectural features of CNN as the foundation network for face detection. It shows accuracy in detecting person wearing a face mask and not wearing a face mask. This study presence a useful tool in fighting the spread of covid-19 virus.

3.EXISTING METHOD

Human beings have not tremendous ability to identify different faces than machines, so automatic face detection system plays an important role in face recognition, headpose estimation etc. It has some problems like face occlusion, and non-uniform illumination. In the existing system there are some of the technologies are used to maintain social distancing and manual temperature monitoring. Since this technology is not much effective, when more people come to a common place.

4.PROPOSED METHOD

The proposed model can be integrated with surveillance cameras to impede the covid-19 transmission by allowing the detection of people who are wearing masks not wearing face masks. The process of monitoring large groups of people is becoming more difficult in public areas. So we will create an automation process for

detecting the faces. We will achieve the highest accuracy and consume the least time in the process of training and detection.

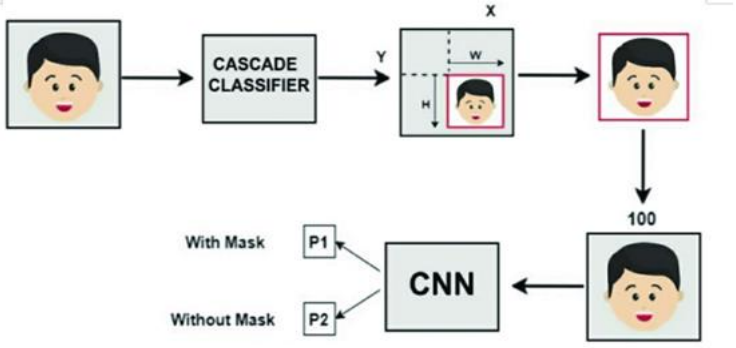

Figure 1: block diagram

5. METHODS OR TECHNIQUES USED

The major requirement for implementing this project using python programming language along with deep learning, machine learning, computer vision and also with python libraries. The architecture consists of mobile net as the backbone, it can be used for high and low computation scenarios. We are using CNN algorithm in our proposed system. Implementation: We have four modules.

1.Data sets collecting : We collect number of data sets with face mask and without masks. We can get high accuracy depends on collecting the number of images.

2.Data sets extracting: We can extract the features using mobile net v2 of mask and no mask sets.

3.Models training : We will train the model using open cv, keras (python library).

4.Face mask detection : We can detect pre-processing image and also detect via live video. If people wear mask, it will permit them, if not then it won't give the access to enter until the mask is detected to prevent them from virus transmission.

6. RESULT

The system can efficiently detect partially occluded faces either with a mask or hair or hand. It considers the occlusion degree of four regions – nose, mouth, chin and eye to differentiate between annotated mask or face covered by hand. Therefore, a mask covering the face fully including nose and chin will only be treated as "with mask" by the model. The main challenges faced by the method mainly comprise of varying angles and lack of clarity. Indistinct moving faces in the video stream make it more difficult. However, following the trajectories of several frames of the video helps to create a better decision – "with mask" or "without mask".

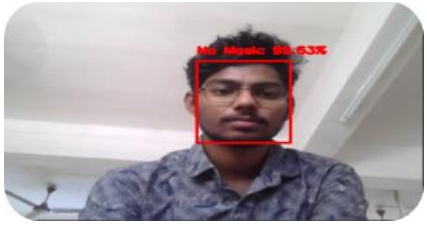

Figure 2: Without Mask

Figure 3: With mask

Figure 4: With partial mask

7. ADVANTAGES

1. Manual monitoring is very difficult for officers to check whether the peoples are wearing mask or not. So in our technique, we are using web cam to detect people's faces and to prevent from virus transmission.
2. It has fast and high accuracy.
3. This system can be implemented in ATM's, banks etc.
4. We can keep peoples safe from our technique.

8. DISADVANTAGES

1. The process of monitoring large groups of people is becoming more difficult in public areas.
2. Temperature monitoring also becomes difficult if many people arrive.

9. CONCLUSION

By the development of face mask detection, we can detect if the person is wearing a face mask and allow their entry would be of great help to the society. The accuracy of the model will be achieved and the optimization of the model is a continuous process and so we are building a highly accurate solution. We can prevent peoples from virus transmission through this system.

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