

Facial Mask Detection to Avoid Corona Virus Infection

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Abstract:- During pandemic situations like Covid-19 commonly known as novel corona virus, since disease is wide spreading across globe and affecting the world dangerously, it becomes crucial to implement few rules to minimize the risk. The vaccinations are just a preventive method but following certain protection methods becomes critical. People need to follow many protection methods in this situation to reduce virus spread. One such major protection method is wearing facial mask in public places.

In addition to this, public service providers have to mandate people to use the facilities only when they properly wear facial mask. In the countries which are highly populated, it becomes a challenge to monitor everyone to see if they are following the rules such as wearing facial mask when being around other people. This paper is literature survey on face mask detection to avoid spread of virus infection using image analysis technique.

Keywords:- Facial Mask; Corona Virus 19; Image Analysis; Disease Prediction; Online Consultation; Pandemic (Novel Corona Virus)

I. INTRODUCTION

The main purpose of the survey is to build the face mask detection model to reduce the corona virus spread among communities. There are several precautions need to be taken in order to suppress the transmission of virus to save lives. Hence facial mask is one of the comprehensive strategies to provide an adequate level of protection during the pandemic like Covid-19. We should make face mask a normal part of our daily lives being around other people in public areas. Facial masks act as a barrier to protect against virus attack.

Face detection is very critical problem in image processing work stream. We need to train face detector to identify the boundaries using deep leaning or machine learning techniques. Firstly we need to load face mask detector with varied data sets & train the detector to classify the data sets. Later stage is to deploy detector to perform face detection and classifying the use case as with mask or without mask. A face detection training dataset consists of images of persons having mask and not having mask. We will use the dataset to build detector using techniques like image analysis and machine learning. The main objective is

to train the face detector model to identify a person wearing face mask and not wearing face mask. We can feed face mask detector model with both real images and artificial data sets created by using some software.

In highly populated countries, monitoring people to identify whether wearing mask or not is impossible and which causes disease to spread in an extensive manner. Hence face mask detector serves as a strategic solution to avoid the disease spread. This survey focus on studying related works on the target system.

II. RELATED WORK

According to data obtained by the World Health Organization, the global pandemic of COVID-19 has severely impacted the world and has now infected more than eight million people worldwide. Wearing face masks and following safe social distancing are two of the enhanced safety protocols need to be followed in public places in order to prevent the spread of the virus. To create safe environment that contributes to public safety, we propose an efficient computer vision based approach focused on the real-time automated monitoring of people to detect both safe social distancing and face masks in public places by implementing the model on raspberry pi4 to monitor activity and detect violations through camera. After detection of breach, the raspberry pi4 sends alert signal to control center at state police headquarters and also give alarm to public. In this proposed system, modern deep learning algorithms have been mixed with geometric techniques for building a robust modal which covers three aspects of detection, tracking, and validation. Thus, the proposed system favors the society by saving time and helps in lowering the spread of corona virus. It can be implemented effectively in current situation when lockdown is eased to inspect persons in public gatherings, shopping malls, etc. Automated inspection reduces manpower to inspect the public and also can be used in any place. [1]

Coronavirus disease 2019 has affected the world seriously. One major protection method for people is to wear masks in public areas. Furthermore, many public service providers require customers to use the service only if they wear masks correctly. However, there are only a few research studies about face mask detection based on image analysis. In this paper, we propose RetinaFaceMask, which is a high-accuracy and efficient face mask detector. The proposed RetinaFaceMask is a one-stage detector, which

consists of a feature pyramid network to fuse high-level semantic information with multiple feature maps, and a novel context attention module to focus on detecting face masks. In addition, we also propose a novel cross-class object removal algorithm to reject predictions with low confidences and the high intersection of union. Experiment results show that RetinaFaceMask achieves state-of-the-art results on a public face mask dataset with 2.3% and 1.5% higher than the baseline result in the face and mask detection precision, respectively, and 11.0% and 5.9% higher than baseline for recall. Besides, we also explore the possibility of implementing RetinaFaceMask with a light-weighted neural network MobileNet for embedded or mobile devices. [2]

III. EXISTING SYSTEM

Many existing face detectors are multi staged and uses computationally expensive algorithms.

➤ *Disadvantages of existing systems*

Limited data set size
Image size is smaller
Faces are drastically small
Lack of clarity
Varying angles
Computationally expensive

IV. METHODOLOGY

In the proposed model, the drawbacks of the traditional face detectors have been very well addressed. This is 2 stage face detector which mainly has 2 phases. Firstly, is to train the detector model with large datasets. Secondly to apply the face detector model in the real time environment.

The proposed model has several datasets to cover both good and bad use case scenarios to classify the target dataset to appropriate group. In this scenario, the face detector, analyze the images supplied as a datasets to arrive at a decision using deep learning techniques, the input datasets used for training could be both real world images or can be created using artificial software. The classification algorithm SVM can be used to provide efficient computation technique in order to classify data sets as with mask images & without mask images. The trained face mask detector can be deployed in real time environment to monitor the public areas to identify people wearing masks and not wearing masks to avoid the wise spread of the disease during an epidemic.

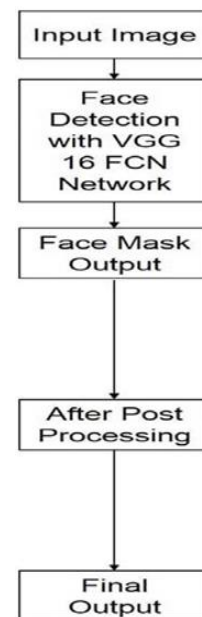


Fig 1:- Face Mask Detector

V. CONCLUSION

The face mask detector system is successful in identifying the persons wearing face mask or not wearing face mask in public areas. The 2 stage detector model helps classify the real world and artificial images into uses cases like people wearing mask or people not wearing mask by identifying the boundary box set during training. The face mask detector can also capture images from video streams to identify the target variable.

The face mask detector can deployed in any places like hospitals, bus stations, railway stations, malls & other public serving facilities to avoid spread of the novel corona virus among the community.

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