

Review on Real Time Face Mask and Social Distancing Detection System

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Abstract— The rapid spread of Covid-19 is become a pandemic and has created abrupt changes in society. Outdoor work in industries, institutes, etc. is stuck up. The present study is focused on the real-time face mask detection and social distancing monitoring system. The first part is related to the colour image dataset creation and the second part is associated with detecting the face mask and safe distancing between human bodies detection. In both parts using a deep learning solution that uses OpenCV and Tensor Flow to train the model and the latter, two truth values are formed and labelled. For each labelled value, the relevant parameters are evaluated and finally, a one truth value of passed input frame is created, based on the trained model result is created. Using this mechanism, face mask detection and safe distance among people is calculated. For this purpose, the pretrained Multi-Task-Cascaded Convolutional Neural network model is used.

Keywords: Face Mask, Social Distancing, Detection System

I. INTRODUCTION

The pandemic COVID-19 has ensured oversized scale imprisonment across the planet associate degree has given rise to a horrifying scenario. the method of vaccination has begun, still, it'll take a protracted time to immunize every and each one. however, its associate degree imperative ought to restart operations at workplaces or organization. the govt. has obligatory associate degree consultative to follow correct safety measures in order that work will resume at places. By taking bound precautions it is often done however it's troublesome to observe everybody manually, there's a desire to implement such a reasonable system that is able to permit the U.S. to figure with all safely at workplaces.

The current study presents the work associated with an automatic time period mask detection and social distancing observance system. The given work consists of 2 main components. the primary half is expounded to mask detection. The second half is related to sleuthing safe distancing of 2m between human bodies in every frame. Also, there's a voice alerting system, alert whenever there's a violation of rules.

II. LITERATURE SURVEY

1) In this research paper, the author has designed a safe environment in a factory workplace for workers to work in a post-covid-19 environment by using computer vision. Here MobileNet V2 model is used for person detection.

- 2) In this presented work, a deep learning and SSD framework is used for the detection of face mask and social distancing through a camera in a real-time system.
- 3) Evaluated a human face with mask and violation alerting system is designed in order to monitor safety environment in outdoor places so that one can resume their work in a pandemic situation also. This model uses on SSD framework and MobileNet V2 model and is based on ROI.
- 4) This author has used sound waves in order to calculate the distance between two human bodies by using sensors. Here variation is determined using RSSI (received signal strength value).
- 5) In the Presented paper, there is the use of a smart AWS platform. A cloud-based infrastructure using AWS is presented. The first challenge they found is the delay processing time, not proper synchronization and action and reaction time rate is late in data. A small scale model is implemented.
- 6) The presented paper is a novel that highlights the global concern for health measures to be taken in the pandemic situation of Covid-19.

III. SYSTEM DESIGN

In section III literature survey is done, it is very important to follow the safety measures which is the only solution if we want to resume our work at workplaces without suffering from this disease. In order to avoid infection from this virus, wearing a face mask and maintaining social distancing is the basic step. In previous work, we have seen the various technologies and models that will help in real-time monitoring. We are presenting an alert monitoring system based on python for image processing and deep neural network to train the model and for achieving the system required.

IV. DESIGN METHODOLOGIES

It is not possible to monitor individually each person whether he is wearing a face mask or not and is maintaining social distancing in crowded places. So we are implementing a system that uses computer vision to monitor real-time safety measures.

The proposed approach uses a deep learning Multi-Task-Cascaded Convolutional Neural network model solution that uses OpenCV and TensorFlow, to train the model. We combine the deep learning model for a fast and efficient deep learning solution for real-time human detection in video streams.

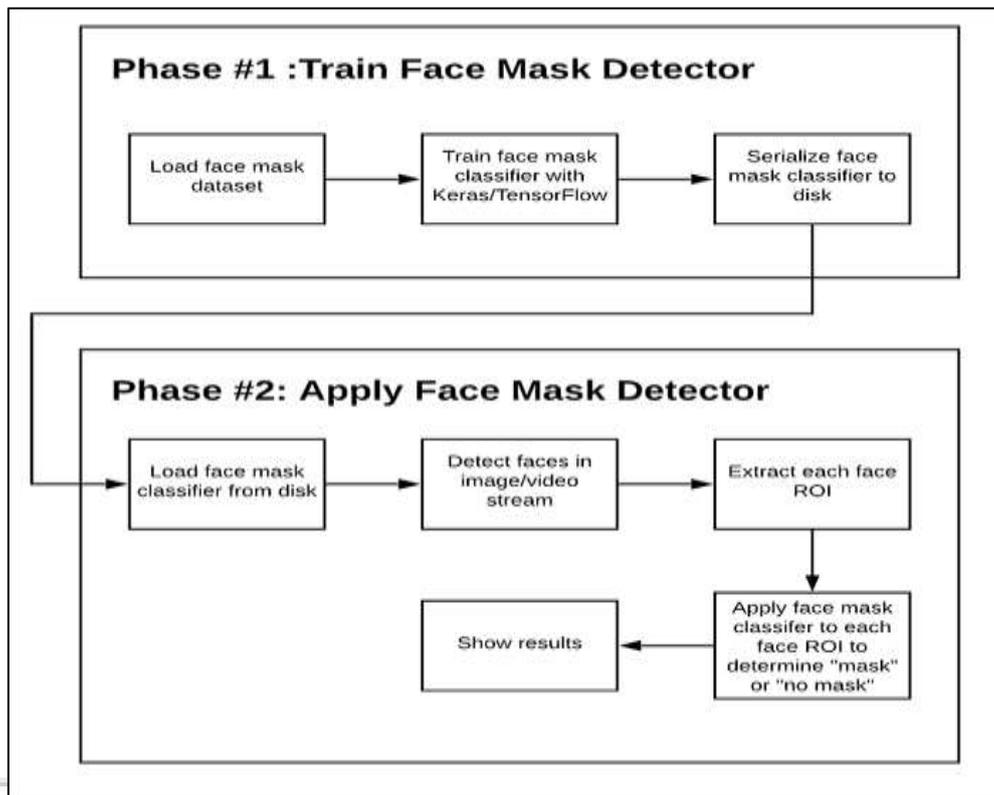


Fig. 1: Flow diagram for face mask detection

In Fig 1. The face mask detection system framework is shown. The system design has two phases of operations that do the image dataset creation, train face mask detector, and apply face mask detection model.

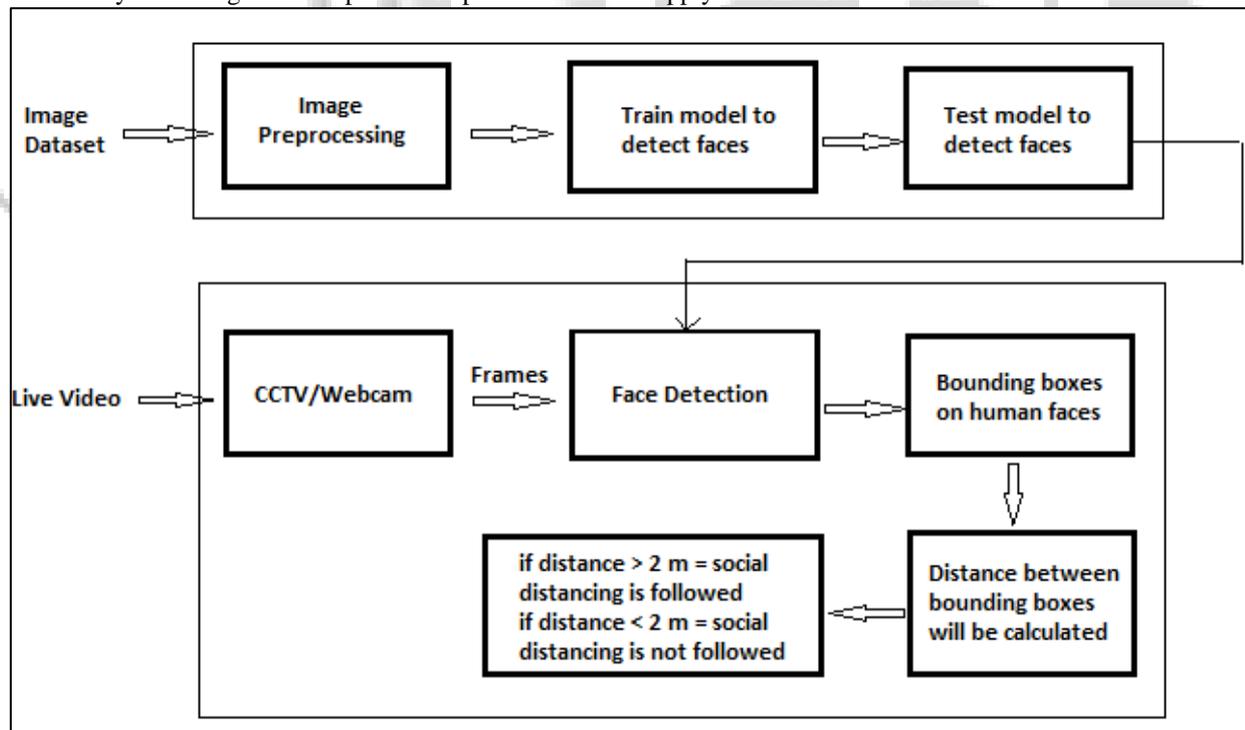


Fig. 2: Block diagram for social distancing detection

Fig 2. A block diagram elaborates the social distancing model working. The system design consists of a framework that preprocesses the image dataset and used this dataset to train the model to detect the faces. Here human face detection model is a test and a bounding box is made on the detected face. The flow given is first we are taking input video stream i.e. real-time data from webcam/CCTV then human

faces are detected within the streams and a bounding box is formed. Previously a threshold value is set for a safe distance. The distance between the centroid of two bounding boxes is measured. This calculated distance is compared with the threshold value if it is less than the set value then it is not a safe distance i.e. violation of social distancing is observed.

We are presenting a sound message system as an alert that will alert the admin cell as well as respect the area under which violation of the rule is done.

V. DISCUSSIONS AND CHALLENGES

As per previous sections (IV) & (V), the proposed system of face mask detection and social distancing monitoring system is discussed in detail. Many case studies ensured to show off the real-time scenario of the pandemic situation but it is very challenging in terms of implementation of the systems in real-time. Designing such kind of system that is flexible for all environments, adaptable changes is quite challenging. This proposed system could be installed to monitor the people in public places. The results analysis that it should be publicly available for future development.

VI. CONCLUSION

In order to protect the society from rapidly spread of coronavirus, various innovative systems are introduced by researchers. With the help of previous literature work, a detailed study is done [1], [2], [3]. Concepts based on social distancing and face mask detection is thoroughly studied with the help of previous Work done and results. Protection from the virus is most important in every aspect. The suggested approach focuses on the real-time automated monitoring of people to detect both safe social distancing and face masks in public places. An efficient computer vision and deep neural network is used for implementation and to monitor activity and detect violations through the camera. More accuracy can be observed if factors like camera quality and environmental conditions are satisfied. Further implementations like coughing and sneezing detection as the key symptoms of virus infection.

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