

Social Distance Monitoring and Face Mask Detection Using Machine Learning

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Abstract: *In the fight against the Corona, social distancing and wearing face mask has proven to be a very effective measure to slow down the spread of the disease. People are asked to limit their interactions with each other, reducing the chances of the corona being spread with physical contact. In past AI/Deep Learning has shown promising results on a number of daily life problems. In this proposed system we will see the detailed explanation of how we can use Python, Computer Vision and Deep learning to monitor social distancing at crowded places. To ensure social distancing protocol in public places, the social distancing detection tool that can monitor if people are keeping a safe distance from each other by analyzing real time video streams from the camera, Monitoring People at crowded places we can integrate this tool to their security camera systems and can monitor whether people are keeping a safe distance from each other or not. The Proposed system focuses on how to identify the person on image/video stream whether the face mask is wear or not with the help of deep learning algorithm. This system works very effectively and efficiently in identifying the social distancing between the people, peoples are wearing face mask or not and generating the alert that can be handled and monitored.*

Keywords: Mask, Social Distance

I. INTRODUCTION

The spread of novel corona virus disease has created a most crucial health crisis across the world. In country like China the increase of severe acute respiratory syndrome virus corona, a new severe infection respiratory disease was grown in Wuhan, China that infected 7,723 people and more than 500 deaths in China was reported. Till now there is no any recondition about any antiviral medicine or any vaccines against COVID-19. The coronavirus has spread rapidly across the global world. At this moment, WHO (World Health Organization) recommended that people around the world should wear masks to prevent the threst of novel coronavirus transmission and also should maintained social distance of at least 3m between two people to stop the spread of coronavirus. Public service will be provided only if they are wearing mask and maintaining harmless social distancing. This project describes the approach to stop the grow of coronavirus by monitoring in real-time if any person is maintaining social distance and wearing face masks in public places like railway stations. During lockdown, the government of India has motivate the people to come up with mask substitution due to lack of PPE available.

II. METHODOLOGY

In our study, we propose a remedy which performs real time detection of individuals to track social distancing norms being followed and real-time face detection to track usage of face-masks. Data from 2 different sources are collected for training and testing the model. We gathered a total of 858 images of people with masks and 681 images of people without a mask. For training purposes, 80 percent images of each class are used and the rest of the images are utilized for testing purposes. Resulting in significant improvements in both speed and accuracy. YOLO is extremely quick, easy to train, robust, stable and gives promising results even for tiny objects, hence, we selected it as our object detector of choice. For an input image/frame, it identify objects belonging to three classes — unmasked faces, masked faces and people. The benefit of this is that authorities can actually select the social distance they want maintained, according to the specific guidelines. The social distance between 2 people is solely judged relative to the initial calibration, and the absolute space need not be provided to the model. This Social Distancing model uses the principle that a camera lens is necessary a convex lens, where the image is necessarily captured on a screen. The main aim of our system is that will identify.

III. SYSTEM FLOW

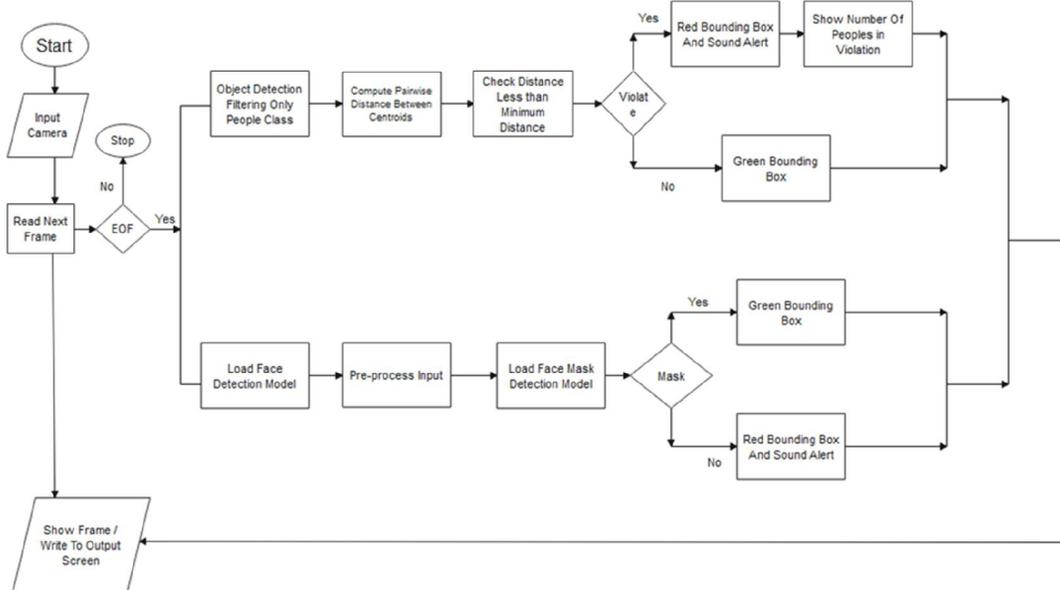


Figure 1: Pipeline

IV. RESULT

Red bounding box shows person not maintaining social distance and green bounding box indicates person maintaining social distance. Red bounding box for face indicates person in frame not wearing face mask and green bounding box indicates person wearing face mask.

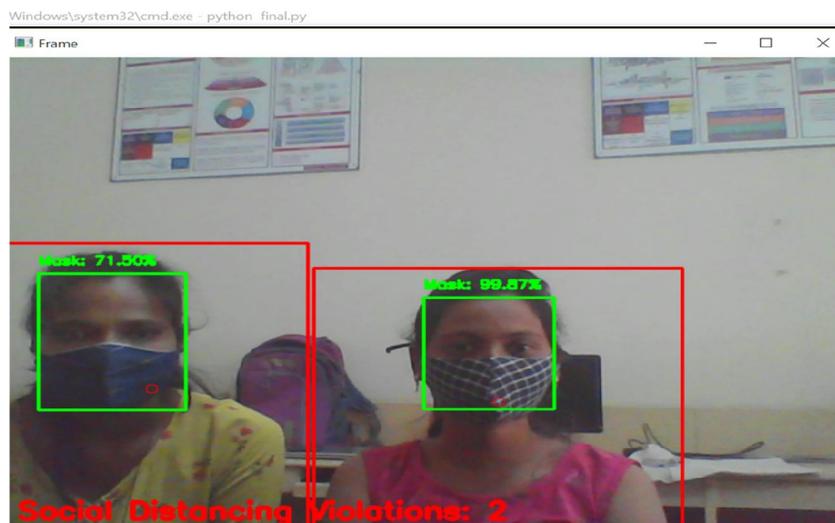


Figure 2: Output

V. CONCLUSION

In this project we have used a recent techniques in the field of computer vision The proposed system will correctly detect the presence of face mask and person is in the safe the distance. The system is accurate, since we have used the architecture for detecting face mask and for distance computing we used Euclidean distance formula. Thus, it makes easier to deploy our model. We believe that this approach will enlarge the safety of the individuals during the pandemic.

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