IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Vol. 10, Issue 6, June 2021

DOI 10.17148/IJARCCE.2021.10635

Social Distance Monitoring using YOLO

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Abstract: COVID-19 caused many damages in all sectors such as health, economics, sports, transportation, business, etc. It affected different people in different ways. So to overcome this pandemic the most useful remedy is to follow social distancing rules. It is not possible to monitor all the places such as parks, markets, shops, malls, schools, colleges, etc. manually. It is necessary to invent tool which will automate the process of monitoring. The concept of person detection algorithm is used to accurately detect a person's presence in areas of interest and is then followed by measuring the distance between the detected persons.

Keywords: Monitoring, Distance.

I. INTRODUCTION

Covid-19 is known as a family member of coronavirus, first spread to Wuhan, China in December 2019. The outbreak then rapidly affected many countries in the world and had been declared as a pandemic by the World Health organization (WHO). One of the best practice known in stopping the spread of Covid-19 is by implementing social distancing between people. To monitor the places which are crowded, we need automated social distancing tracker. We use YOLOv3 object detection model. It is one of the most effective object detection algorithms and has been involved in most innovative ideas that have and are coming from the research community associated with computer vision. It is trained using COCO dataset which identifies human being from all the available objects in the provided images or videos. Euclidean distance between two persons is calculated & it is less than 2 meters then it triggers a warning in the event of safety violation.

Fig 1: Social Distance

II. MOTIVATION

It can be observed that social distancing can decrease the number of infected Patients and reduce the burden on healthcare organizations. It also lowers the mortality rates by assuring that the number of infected cases (patients) does not surpass

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the public healthcare capability. If social distancing is implemented, it can perform a pivotal role in overcoming the virus spread and preventing the Pandemic disease's peak.

III. PROBLEM DEFINATION

During this pandemic period using social distance tracker, we will keep track of human activities at public places, and henceforth we will compute and summarize distances between people and monitor the social distancing violations across the town. This will also restrict people from coming together and stop social gatherings. People that take in massive amount at religious places can make condition worst. This technique of monitoring social distancing are going to be beneficial all around the world. It will monitor people in an image or a video using image processing. And also keep track of people maintaining social distance (Distance between 2 people should be 2 meters).

IV. ACTIVITY DIAGRAM

- Upload Image/Video: First step is to upload image or video as an input.
- Euclidean Distance: In this step distance between two persons is calculated.
- Output: In this step we get bounding box around person either in green colour if distance is less or equal to 2 meters or in red colour if distance is more than 2 meters.

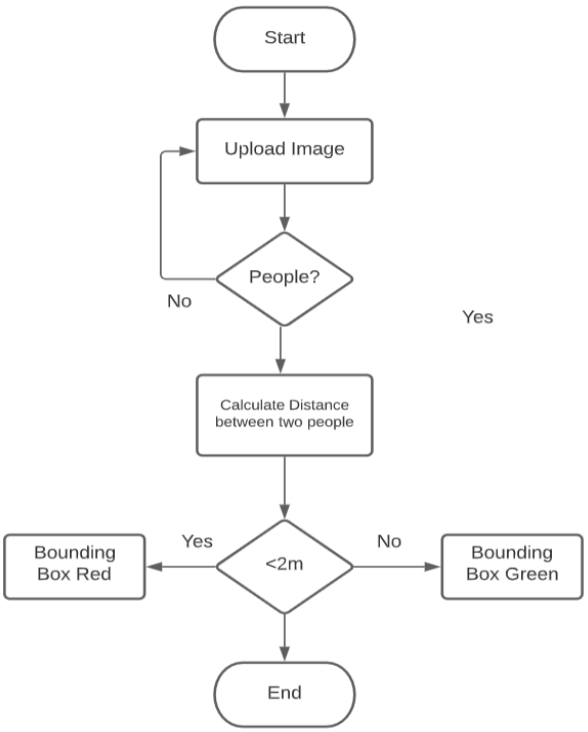

Fig 2: Activity Diagram

V. ADVANTAGES

- It helps to maintain social distancing.
- It contributes to lowering the risk of spreading COVID.
- It also lowers the mortality rates by assuring that the number of infected cases (patients) does not surpass the public healthcare capability.
- To aware people to follow the rule of social distancing.

VI. LIMITATION

- Our methodologies do not distinguish between strangers and people from the same household. Therefore, all individuals in an indoor environment are encouraged to maintain a 6-foot distance from each other.
- Camera is damaged then our technology will not work.

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VII. APPLICATION

- The technology can be used in the classroom to check whether students have maintained social distancing.
- The technology can be used on the road where the pedestrians are walking to check whether people have maintained social distancing.
- The technology can be used on the railway station and bus station.

VIII. CONCLUSION

Protecting oneself from the critical virus is most important. This automated social distance tracker will minimize the human efforts of monitoring. The image processing based social distancing framework with deep learning neural network for analysis is evaluated. The research would be further extended by implementing the robust prediction system and real time monitoring of social distance with large data size.

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