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Covid-19 Social Distancing Detection System Using YOLO v3

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ABSTRACT: The report presents a strategy for social distancing detection, the unprecedented outbreak of the 2019 novel coronavirus, termed as COVID-19 by the globe Health Organization (WHO), has placed numerous governments round the world in an exceedingly precarious position. The effect of the COVID-19 outbreaks, in advance witnessed through the residents of China alone, has now become a matter of grave concern for virtually every country within the world. The shortage of assets to undergo the COVID-19 outbreak mixed with the worry of overburdened healthcare systems has forced a majority of those countries into a state of partial or complete lockdown. The number of laboratories confirmed coronavirus cases has been increasing at an alarming rate throughout the planet, with reportedly quite 2.2 million confirmed cases as on 20 April 2020. So, maintaining social distancing is incredibly important. to gauge the space between people to mitigate the impact of this coronavirus pandemic. The detection tool was developed to alert people to take care of a secure distance with one another by evaluating a video feed. The video frame from the camera was used as input, and therefore the open-source object detection pre-trained model supported the YOLOv3 algorithm was employed for pedestrian detection. Later, the video frame was transformed into top-down view for distance measurement from the 2D plane. the gap between people is often estimated and any noncompliant pair of individuals within the display are going to be indicated with a red frame and line. The proposed method was validated on a pre-recorded video of pedestrians walking on the road. The result shows

that the proposed method is ready to work out the social distancing measures between multiple people within the video. The developed technique will be further developed as a detection tool in real-time application.

Keywords—*Covid-19, Person Detection; Social Distancing,*

I. INTRODUCTION

When the novel coronavirus (Covid-19) pandemic emerges, the spread of the virus has left public keep anxiety if they are doing not have any effective cure. the globe Health Organization (WHO) has declared Covid-19 as a deadly disease thanks to the rise within the number of cases reported round the world. To contain the pandemic, many countries have implemented a lockdown where the govt. enforced that the citizens to remain reception during this critical period. the general public health bodies like the Centres for Disease Control and Prevention (CDC) had to create it clear that the foremost effective thanks to impede the spread of Covid-19 is by avoiding close contact with people. To implement social distancing, group activities and congregations like travel, meetings, gatherings, workshops, praying had been banned during the quarantine period. The people are encouraged to use phone and email to manage and conduct events the maximum amount as possible to reduce the person-to-person contact. To further contain the spread of the virus, people are informed to perform hygiene measures like frequently washing hands, wearing mask and avoiding close contact with those that are

ill. However, to scale back the impact of the pandemic on the country's economy, several governments have allowed a limited number of economic activities to be resumed once the quantity of latest cases of Covid-19 has dropped below a particular level. As these countries cautiously restarting their economic activities, concerns have emerged regarding workplace safety within the new post-Covid-19 environment.

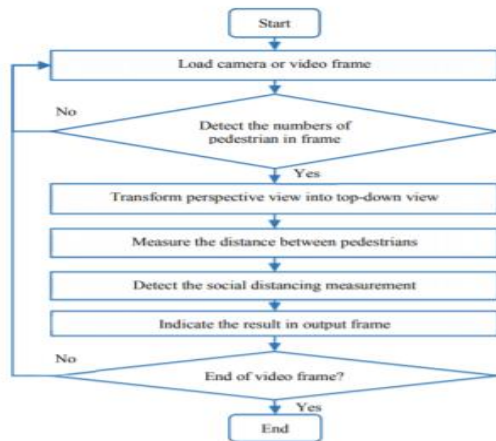


Fig. 1 Flow chart
II. LITERATURE SURVEY

[1] This paper by Mohd Zafri Baharuddin proposes when the novel coronavirus (Covid-19) pandemic breaks out, the public is concerned about the virus's spread if there is no successful cure. Due to a rise in the number of cases reported around the world, the World Health Organization (WHO) has declared Covid-19 a pandemic. To control the pandemic, several countries have imposed a lock-out, in which people are required to remain at home during this crucial time. Public health organizations such as the Centers for Disease Control and Prevention (CDC) have to make it clear that avoiding direct contact with other people is the most successful way to slow the spread of Covid-19. The people of the world came together to help flatten the curve on the Covid-19 pandemic. Physical distancing is being practiced all over the world. To use social distancing, group games, and other techniques travel, meetings, and events are examples of congregations. During the quarantine, seminars and prayer were prohibited indefinitely. People are encouraged to communicate via phone and email. To reduce costs, plan and execute activities as much as possible person-to-person communication. The gap between people will be measured computer vision, and any noncompliant combine of individuals will be marked with a red frame and a red line. A video of pedestrians walking down a street was accustomed validate the projected process. The image results unconcealed that the proposed technique is capable of deciding social distancing measures between

individuals, which it might be any custom-made to be used in alternative settings such as the workplace, restaurant, and school. Furthermore, via way of means of optimizing the pedestrian detection algorithm, incorporating different detection algorithms together with masks detection and human frame temperature detection, growing the computational energy of the hardware, and calibrating the digital digicam angle view, the paintings may be advanced even further.

Software Requirements	Description
Operating System	Windows XP/7
Coding Language	Python
IDE	Anaconda

Fig 2 : Software Requirements

Hardware	Requirements
Processor	Pentium IV 2.4 GHz or above
Hard Disk	250 GB or above
Monitor	15 VGA Color
RAM	1 GB

Fig 3 : Hardware Requirements

Keywords: Passwords; Congregation, CDC, pedestrians

[2] This paper by Afiq Harith Ahamad proposes of the paper describes a tool for detecting social distancing using deep learning to assess the gap between people in order to reduce the effect of the coronavirus pandemic. By analyzing a video stream, the detection tool was created to alert people to keep a safe distance from each other. The open-source object detection pre-trained model based on the YOLOv3 algorithm was used to detect pedestrians using the video frame from the camera as input. Later, the video frame was converted to a top-down view for measuring distances in the 2D plane. Any noncompliant pair of people in the show will be marked with a red frame and red line. A pre-recorded video of pedestrians walking down the street was used to validate the proposed process. The outcome demonstrates that the proposed approach is capable of determining the social distancing measures between multiple individuals in a video. The developed technique could be used as a real-time detection method in the future. During the quarantine era, community activities and congregations such as travel, meetings, conferences, seminars, and praying were prohibited in order to achieve social distancing. People are encouraged to manage and execute events as much as possible via phone and email in order to reduce face-to-face communication. To help stop the virus from spreading further, people are being encouraged to practice good hygiene, such as washing their hands

regularly, wearing masks, and avoiding close contact with sick people. However, there is a distinction between learning what to do to stop the virus from spreading and actually doing it.

Keywords- *quarantine, pandemic*

[3] This paper by Krisha Bhambani proposes with the COVID-19 pandemic's recent emergence and rapid spread, the public's need to observe social distancing norms and wear masks in public is only growing. According to the World Health Organization, people in public places should maintain a 3ft or 1m space between them to maintain proper social distancing. Using YOLO object detection on video recordings and photographs in real time, this paper focuses on a solution to help implement proper social distancing and wearing masks in public. In comparison to its rivals, the detection of masked faces and human subjects based on YOLO has greater robustness and faster detection speed, according to the experimental results presented in this paper. With a video inference speed of 38 frames per second, our proposed object detection model achieved a mean average precision score of 94.75 percent. Even in complex setups, the network ensures inference speed capable of generating real-time results without sacrificing accuracy. In a variety of situations, the proposed social distancing approach produces positive results.

Keywords—*YOLO, WHO, pandemic*

[4] This paper by Rudraksh Kapil proposes of the COVID-19 pandemic, the method of social distancing was widely adopted as a non-pharmaceutical prevention measure to combat the spread of infectious diseases. This paper proposes SD-Measure, a new method for detecting social distancing in video footage. To detect people in a video frame, the proposed architecture uses the Mask R-CNN deep neural network. A centroid tracking algorithm is used to monitor the subjects over the course of the footage to reliably determine whether social distancing is practiced during the interaction between individuals. We use authentic algorithms to estimate people's distance from the camera and between themselves in order to see if the social distancing guidelines are being followed. The section introduces SD Measure, a novel framework for determining whether a group of people is adhering to the 'Social Distancing' guidelines of keeping a minimum distance of 6

feet (or 1.8 metres) when viewed from video footage of a public area. In this order, the proposed system accomplishes four main tasks:

- A) Person Tracking
- B) Person Detection
- C) Estimation of the distance from the camera
- D) Estimation of Pairwise Social Distancing

Keywords—*Pharmaceutical, Social distancing*

III. CONCLUSION

A deep learning model is used to suggest a technique for detecting social distancing. The gap between people can be measured using computer vision, and any noncompliant pair of people will be marked with a red frame and a red line. A video of pedestrians walking down a street was used to validate the proposed process. The visualization results revealed that the proposed method is capable of determining social distancing measures between individuals, and that it could be further adapted for use in other settings such as the workplace, restaurant, and school. Furthermore, by optimizing the pedestrian detection algorithm, incorporating other detection algorithms such as mask detection and human body temperature detection, increasing the computational power of the hardware, and calibrating the camera perspective view, the work can be improved even further.

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