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Staying Apart Together from Social

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Abstract: ***The paper presents a methodology for social distancing detection using deep learning to evaluate the distance between people to mitigate the impact of this coronavirus pandemic To Know Social Distancing is the best possible way to detain the spread of Covid Even though the vaccine has been found and working effectively in saving the lives of people, we use Deep Learning with python to monitor social distancing in public places. This is a software tool that monitors if people are maintaining proper social distancing norms or not by analyzing real-time video streams from a CC camera. We use YOLO Model which is trained by the COCO dataset. The detection tool was developed to alert people to maintain a safe distance from each other by evaluating a video feed. The video frame from the camera was used as input and the open-source object detection***
Keywords: Social Distancing, Deep Learning, YOLO, COCO. Abbreviations and Acronyms, YOLO-You Only Look Once, COCO-Common Objects in Context, DNN- Deep Neural Network

I. INTRODUCTION

The project aims to use computer vision to detect people who are not socially distancing themselves and alert the authorities in order to take necessary action. Social distancing has become an important part of keeping the public safe during the Covid-19 pandemic. Covid-19 is the scientific name of coronavirus. This disease is considered as a pandemic when it is spread to different countries and caused fatalities.

The spread of disease is due to the contact of infected persons with other persons. So this is implemented automatically by our software tool which not only monitors people but also highlights the persons who are violating social distancing norms with red color boxes. We use CCTV cameras for the automatic monitoring of people. This tool can be used in places like airports, malls Social Distancing is one of the most effective strategies to reduce the spread of infectious diseases, such as the coronavirus (COVID-19). Social distancing is an essential step in preventing the spread of COVID-19. Social distancing is reducing physical interaction between people and it lowers the chances of spreading illness between people

II. PROPOSED SYSTEM

The proposed work includes usage of yolo v3 which is a fully convolutional neural network algorithm to detect the people in the video frames. OpenCV which is a real-time computer vision library is used to feed the input framed from the images or videos captured by the cameras to the yolo v3 neural network. The system will then provide the results for the particular region and provide a statistical analysis of the region captured by the cameras. Yolo v3 which is capable of recognizing 80 different objects in given input images and videos is used for the object detection phase in the algorithm. Firstly, Yolo v3 is having 53 layer network trained on Imagenet. It uses a variant of darknet. But for the purpose of detecting object, more 53 layers are used on to the previous set of layers. Thus yolo v3 has total 106 layers in its network.

III. METHODOLOGY

Avoid large gatherings and limit contact with people outside of your home. Keep a physical distance of at least 6 feet from others when you are out in public. Monitor your health for any symptoms and seek medical attention if necessary. Data will be collected through a combination of surveys, interviews, and observational studies. Surveys will be conducted to assess the public's attitudes and behaviors regarding social distancing.

Interviews will be conducted with public health experts to gain an understanding of how social distancing is being implemented in different settings. The methodology for this project will involve the use of a range of Python libraries, including Numpy, OpenCV, and Imutils. The project will also make use of data from the World Health Organization (WHO) and other sources to better understand the effects of social distancing on the spread of COVID-19. The project will begin by analyzing the data from the WHO and other sources to better understand the spread of COVID-19

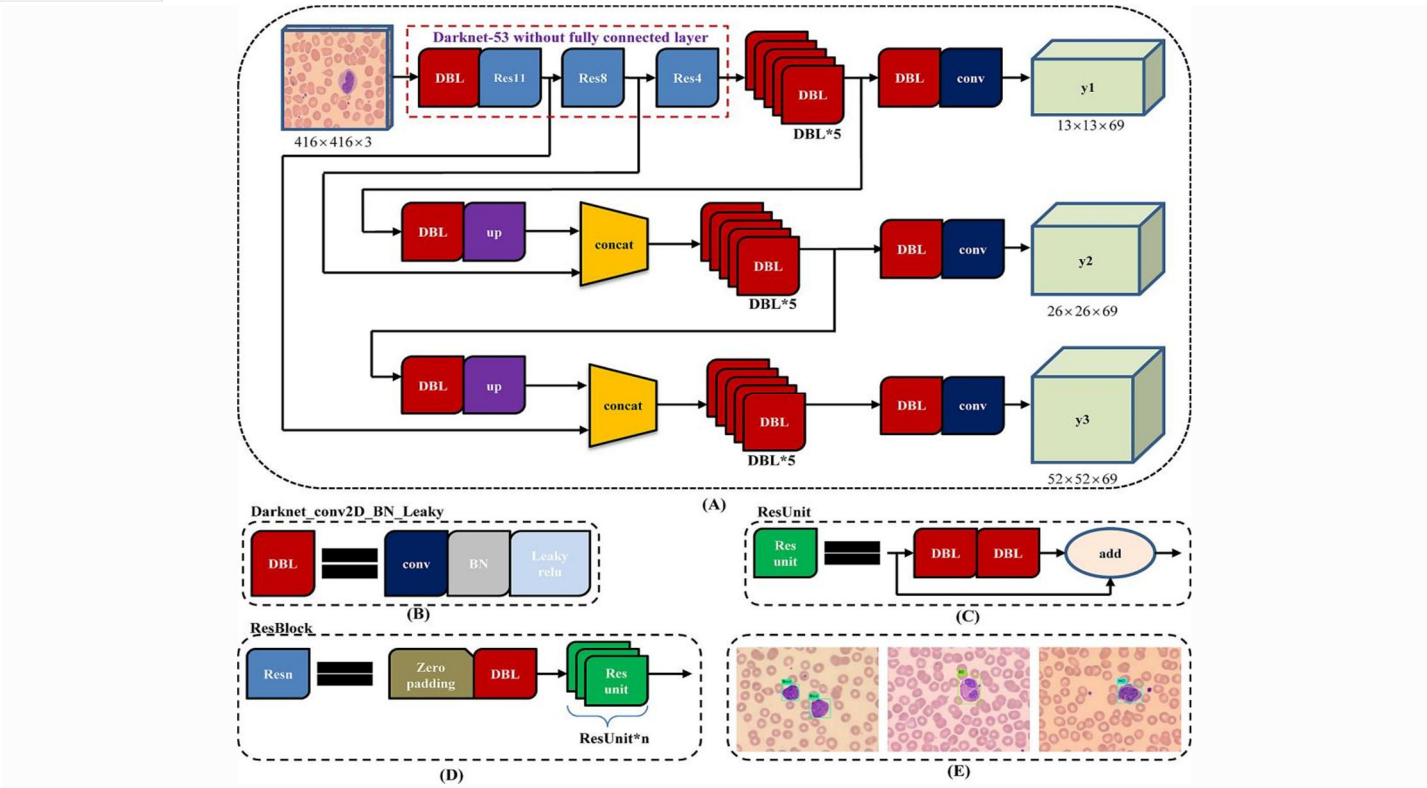
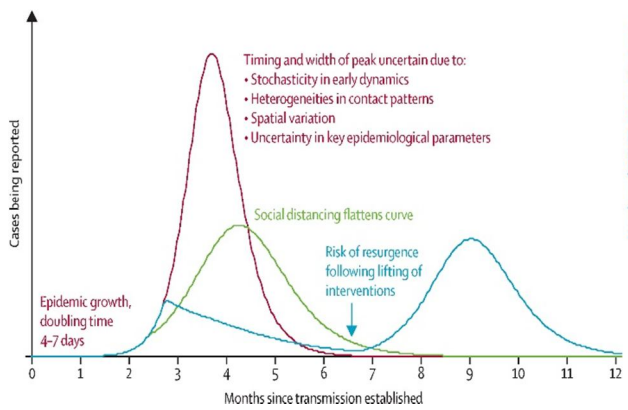
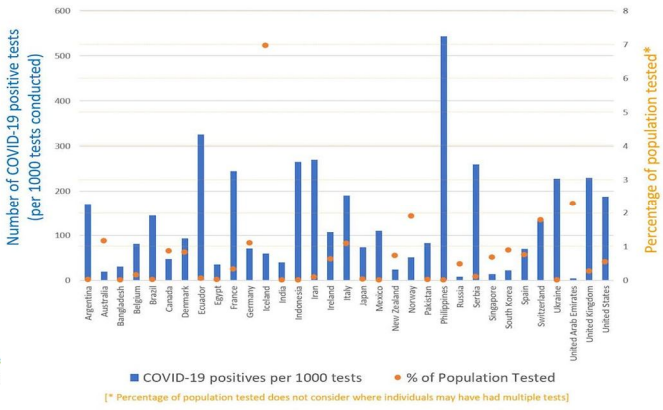


Fig:1 Architecture diagram

IV. SOFTWARE DEVELOPMENT MODEL

1) Taking video file as input using cv2.VideoCapture()
2) Setting up the YOLO v3 network
3) Detecting the "person" class in the current video frame and using cv2.dnn.blobFromImage() for performing mean subtraction, scaling and swapping functions. If confidence is greater than 50% then proceed to step 4.
4) Calculating the co-ordinates of bounding boxes.
5) Using non maximal suppression for removing overlapping boxes
6) Calculating distance between two people using the formula If distance120 pixels: Increase the safe people count Show the results on the dashboar
7) If unsafe people count > predefined threshold: Send a mail using smtplib module and text message using Fast2SMS API to authoritie





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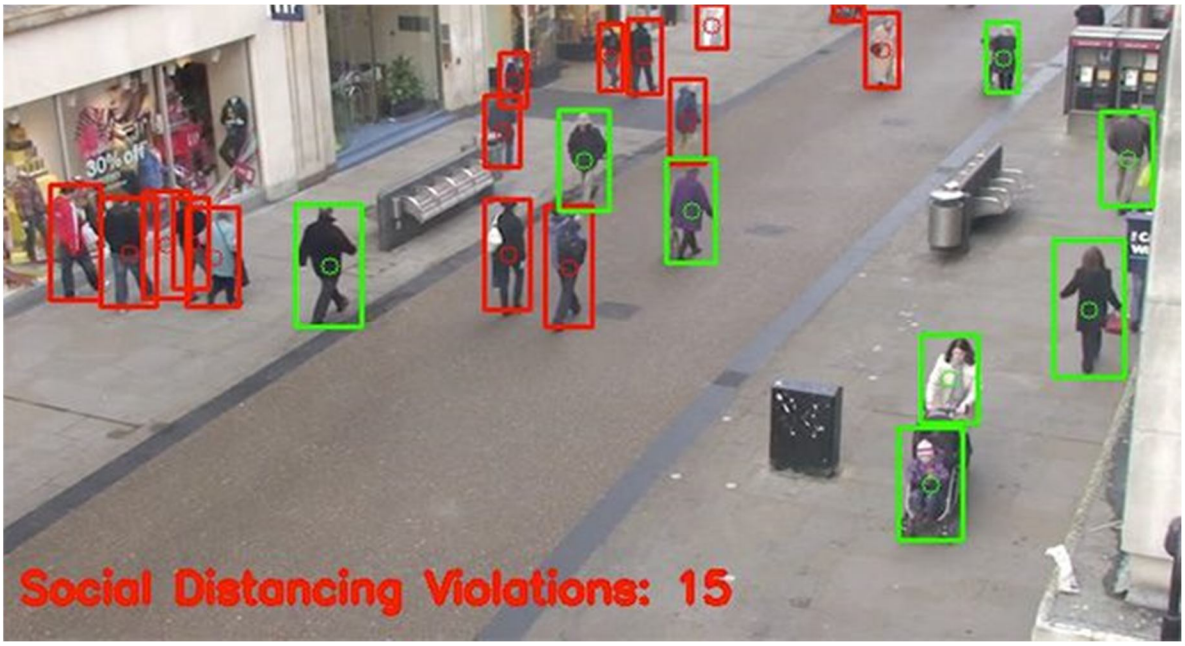
V. BENEFITS

1) It delays peak of epidemic and consecutively provide time to health authorities to slow down influenza transmission. Moreover it provides time to arrange for basic medical amenities such as Forehead Thermometer, Infrared Thermometer, FFP2 Mask, FFP3 Mask, Face Mask, Surgical Face Mask, KN95, N95, Protective Mask, beds, ventilators etc.
2) It reduces number of infections in the people.
3) It spreads number of infectious people over a longer period of time.
4) Social distancing reduces the rate of disease transmission and can stop an outbreak.
5) It is most effective technique when infection is being transmitted due to droplet contact such as coughing or sneezing.

VI. DRAWBACKS

1) It is less effective when infection is transmitted primarily due to contaminated water or food or by mosquitoes or insects
2) .It can cause loneliness and often depression if people are adjusted to human interaction environment.
3) It reduces productivity and loss of other advantages associated with human interaction

Output Snapshot



VII. FUTURE WORK

To Know Social Distancing is the best possible way to detain the spread of Covid Even though the vaccine has been found and working effectively in saving the lives of people, we use Deep Learning with python to monitor social distancing in public places The Centroid tracking algorithm is used for calculating pairwise distances between the objects. To automate the process of monitoring social distancing it is an efficient real-time deep learning-based framework. To check social distance violations between people, an approximation of physical distance to the pixel is used.

VIII. CONCLUSION

The Centroid tracking algorithm is used for calculating pairwise distances between the objects. To automate the process of monitoring social distancing it is an efficient real-time deep learning-based framework. To check social distance violations between people, an approximation of physical distance to the pixel is used, and a threshold is defined. Furthermore, a centroid tracking algorithm is used for tracking peoples in the scene. Experimental results indicated that the framework efficiently identifies people walking too close and violates social distancing. Euclidean distance as a metric, we calculated pairwise centroid distance between detected bounboxes. The violations are displayed in the output along with the violated persons

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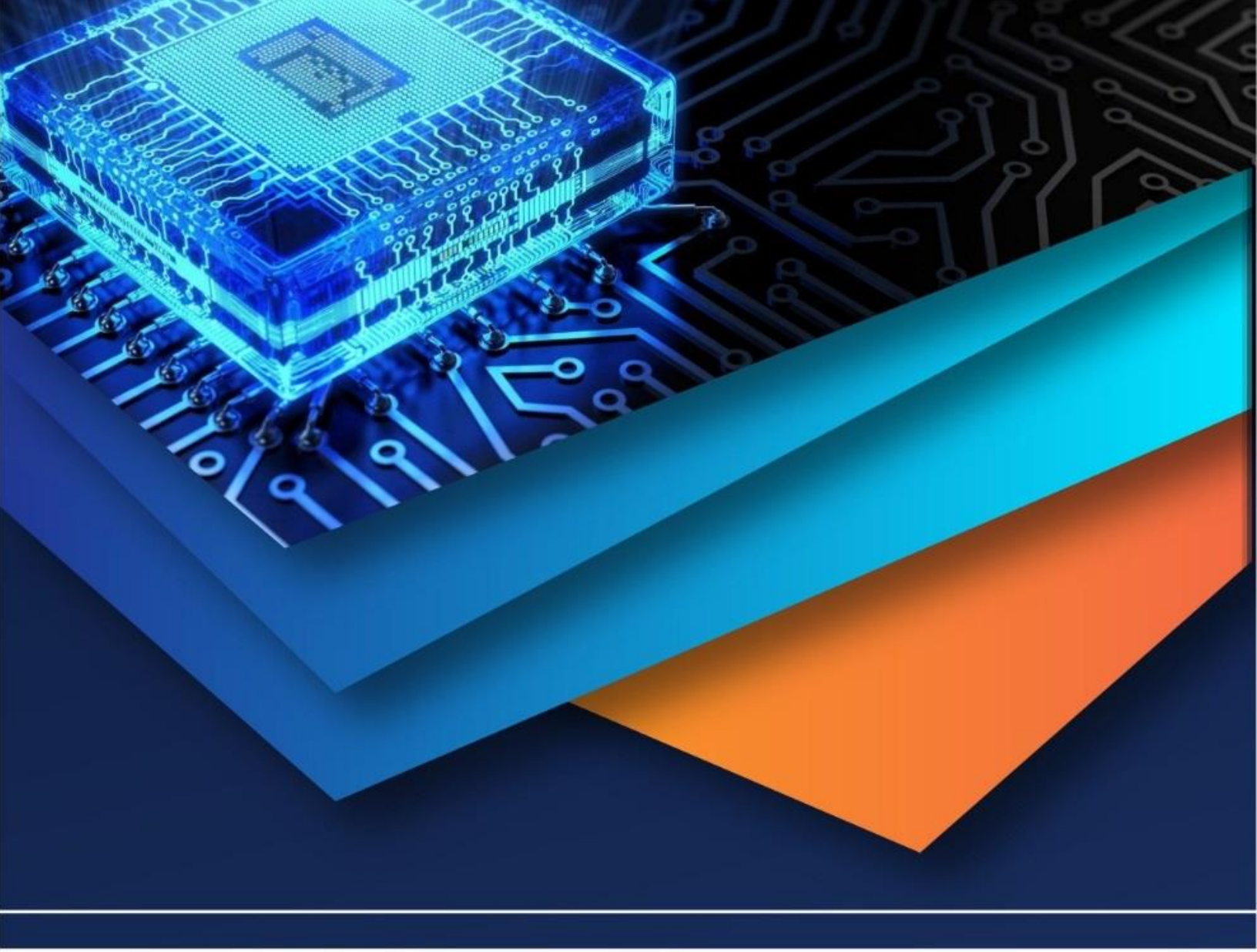

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