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SOCIAL DISTANCE MONITORING WITH SURVEILLANCE

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Abstract*—In December , Wuhan, China, became the origin of COVID 19. The WHO has classified the outbreak, which briefly afflicted numerous nations throughout the world, as an epidemic. Keeping Social Distance has emerged as one of the trendy ways to aid in the spread of COVID-19 as the epidemic crisis has expanded to every corner of the globe and made things worse. Maintaining social distance is crucial because cases have been increasing at an incredibly rapid rate everywhere. The prevention of contagion transmission by reducing human physical contacts, like the millions of people, is what social distancing refers to. Social distancing refers to preventative measures used to stop the spread of disease. These include avoiding crowds and maintaining a suitable distance between individuals. Examples of these places include shopping malls, public buildings, seminaries, universities, airports, and workplaces. Our design's primary goal is to ensure people's safety in public spaces by automatically observing whether they keep a safe social distance or not. The suggested system is a deep literacy outcome that trains the model with OpenCV. For a quick and efficient deep literacy result for fatality finding in videography aqueducts, we combine the deep literacy MobileNetV2 model with the SSD Framework, and triangle similarity property is employed to quantify distance between people detected by camera in video.

***Keywords*—Social Distancing,OpenCV, MobileNetV2,SSD Framework**

1. INTRODUCTION

In December , Wuhan, China, became the origin of COVID 19. The World Health Organisation (WHO) later proclaimed the epidemic to be a pandemic as it quickly spread to numerous nations around the world. The world is currently experiencing a pandemic that has worsened the situation. One of the most efficacious ways to stop COVID-19 from outspread is maintaining social distance. Social distance maintainenance is crucial since the illnesses are spreading quickly over the world. In order to prevent the spread of a

virus, social distancing necessiates preventing crowds in public places, avoiding physical contact with people there, and keeping a threshold distance from them.

2. LITERATURE REVIEW

While surveillance technology can be useful in gauging social distance compliance, the study concluded that there are issues with privacy, ethics, and the possibility for technology exploitation. The authors advised that any use of this technology should be constrained by explicit ethical guidelines and pertinent legislative requirements. The use of surveillance cameras, drones, and wearables for social distance monitoring during the COVID-19 pandemic was examined in another study that was published in the Journal of Medical Systems in 2020. The survey indicated that the most popular technology for social distance monitoring was surveillance cameras, but it also raised issues about data security and privacy. The authors of the article opined that it's essential to maintain a balance between the priorities protecting the public health and preserving consumers' privacy rights. The possible advantages and disadvantages of social distance monitoring with surveillance technologies were addressed in a commentary published in the British Journal of General Practise in 2020. While pointing out that such technology can aid in enforcing social distance rules and limiting the spread of dangerous diseases, the authors also voiced concerns about privacy, trust, and the possibility of over-reliance on technology. In general, the research indicates that social distance monitoring using surveillance technology can be successful in ensuring adherence to social distance rules, but there are issues with privacy, ethics, and potential technology abuse. Therefore, any use of this technology must be done with due care to protect individual privacy and to provide responsibility and openness in the handling of data.

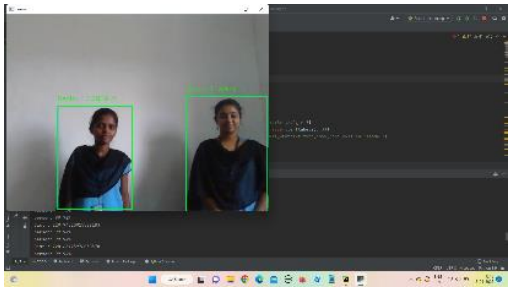
3. METHODOLOGY

By tracking in real time whether a person is observing safe social distance in public settings, our system aims to stop the virus from spreading. In order to balance resource constraints and recognition accuracy, this project combines the lightweight MobileNetV2 neural network with the Single Shot Detector (SSD) and transfer learning technique. This allows it to be used on real-time video surveillance to monitor public spaces and identify people wearing face masks while maintaining safe social distance. Our approach makes use of OpenCV and MobileNet V2 to analyse Real-Time Streaming Protocol (RTSP) video streams using neural networking models. In order to achieve the real-time needs and maintain excellent quality, it uses a combination of contemporary deep learning and traditional projective geometry approaches. If people are keeping their social distance, the bounding boxes will be shown in green. Red coloured boundary boxes will be shown if people don't keep their distance from one another. The first step is to identify the individuals in the frame and then draw a box around each of them. to

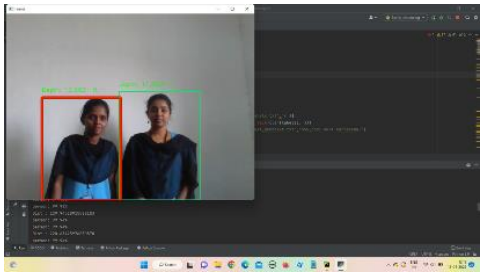
identify people in video and gather bounding box data. Each individual in the frame has a bounding box at this point. Estimating the person's position within the frame is necessary. For example, we can consider the subject's position in the frame to be at the bottom centre point of the enclosing box. After that, we transform the bottom centre point of each person's bounding box to get their position in the (x,y) coordinates of the bird's eye perspective. in order to project those points in a bird's eye view and determine the bottom centre point for each bounding box. The next step is to calculate the aerial distance (Point) between each pair of persons and scale the distances in both the horizontal and vertical directions using the scaling factor determined from calibration. Every frame's centroid is regarded as the human body's central point. A distinct centroid in terms of (x,y) is assigned to each enclosing box.

Generation of alerts :All boxes and people are now separated from one another. Now that we've considered a threshold value, we can conclude that major violations have occurred if the distance estimated is smaller than the threshold limit and the boxes are marked by red boxes. Green boxes will be used to denote the bounding boxes if the distance between them is less than the safe distance but larger than the threshold limit. Similarly, boxes will be marked with green coloured boxes if the space between them is more than or equal to the established safer distance (6 feet in real life). Humans will have varying risks of contracting an infection depending on the colour of their bounding boxes. People will wear red and green boxes based on threshold distance.

4. RESULTS



Social Distance Maintained



No Social Distance Maintained

5. DISCUSSION

In notably during the COVID-19 pandemic, social distance monitoring with surveillance has grown in popularity as a tactic for encouraging adherence to social distance rules. Real-time monitoring of public spaces is made possible by the deployment of surveillance technologies like CCTV cameras and drones, which also aid in spotting instances of non-compliance. However, using surveillance for social distance monitoring has a number of ethical, legal, and practical implications.

Privacy is one of the primary issues. Significant privacy issues are raised by the

gathering and use of surveillance data, especially if the data is used in ways that are opaque or if it is shared with other organisations without proper authorization. The protection of data privacy and compliance with applicable laws and regulations should be ensured when collecting, storing, and using surveillance data.

The possibility for abuse of surveillance data is another issue. Significant ethical concerns are raised when surveillance data is used for purposes other than social distance monitoring, including for commercial or law enforcement objectives. To avoid misuse and safeguard human freedoms, it is crucial to establish precise rules and limitations on the use of surveillance data.

There are other practical issues to consider when combining social distance monitoring and surveillance. Surveillance technologies, for example, may be expensive to establish and maintain, and they may have technological constraints that limit their usefulness. Furthermore, there may be questions regarding the accuracy and reliability of surveillance data, especially if algorithms or other analytical tools are employed to analyse the data. Despite these challenges, social distance monitoring combined with surveillance can be an effective technique for encouraging compliance with social distancing recommendations, especially in high-risk situations such as hospitals or public transit systems. However, it is critical to carefully weigh the benefits and drawbacks of social distance monitoring and surveillance in order to guarantee that it is used ethically and successfully.

Establishing explicit standards and restrictions on the use of surveillance data, adopting proper privacy and data protection measures, and fostering transparency and open communication with the public may all be part of this.

6. CONCLUSION

An effective solution is required to manage a huge population, and this survey study focuses on maintaining social distance. Authorities can keep watch of people's actions and control large gatherings using installed CCTV to prevent legal offences. People will be notified with a green light taking into account as they endure a safe distance. When CCTV detects an increasing number of individuals gathering, a red light flashes and the local police are informed, allowing the circumstances to be immediately brought under control.

In this project, the approach employs computer vision and the MobileNet V2 architecture to help maintain a secure environment and ensure individual protection by automatically monitoring public places to prevent the spread of the COVID-19 virus and to assist police by reducing physical surveillance work in containment zones and public areas where surveillance is required via camera feeds. Thus, under the current circumstances, when the lockout is lifted, this proposed system will operate efficiently and help to track public locations quickly and in an automatic manner. We have gone through the tracking of social distancing as it relates to human health in great depth.

The implementation of this method was successfully tested in real-time utilising a web cam. The approach has the potential to drastically minimise infractions through real-time interventions, hence the suggested system would increase public safety by saving time and assisting in the reduction of coronavirus spread. This approach can be employed in areas such as temples, shopping malls, metro stations, airports, and so on. The use of surveillance equipment for social distance monitoring can be a useful tool in limiting the spread of infectious diseases, particularly in public spaces where social distancing can be difficult to enforce.

However, in order to protect individual privacy and civil liberties, the deployment of such technology must be supported by proper protections and ethical concerns.As with any monitoring technology, there are potential hazards of misuse and abuse that legislators and law enforcement agencies must evaluate and handle. Furthermore, the use of such technologies should be supported by open and honest communication with the public in order to foster confidence and assure responsibility. Finally, the choice to employ social distance monitoring technology must assess the possible benefits against the potential risks, ensuring that the measures implemented are proportional, required, and respectful of individual rights and freedoms. As a result, Social Distance Monitoring is vital to preventing the spread of COVID 19.

7.ACKNOWLEDGEMENTS

References

1.Adlhoch(2020). https://www.ecdc.europa.eu/sites/default/files/documents/covid19-social-distancing-measuresg-guide-second-update.pdf.

2. Adolph C., Amano K., Bang-Jensen B., Fullman N., Wilkerson J. medRxiv. 2020 3. Ahmad M., Ahmed I., Ullah K., Khan I., Adnan A. 2018 9th IEEE annual ubiquitous computing, electronics mobile communication conference (UEMCON) 2018. pp. 746–752. [CrossRef] [Google Scholar]

4. Ahmad M., Ahmed I., Ullah K., Khan I., Khattak A., Adnan A. International Journal of Advanced Computer Science and Applications. 2019;10 doi: 10.14569/IJACSA.2019.0100367.

5. Ahmad M., Ahmed I., Khan F.A., Qayum F., Aljuaid H. International Journal of Distributed Sensor Networks. 2020;16 1550147720934738.

6. Ahmed I., Adnan A. 2017. Cluster computing; pp. 1–22.

7. Ahmed I., Ahmad A., Piccialli F., Sangaiah A.K., Jeon G. IEEE Internet of Things Journal. 2018;5:1598–1605.

8. Ahmed I., Ahmad M., Nawaz M., Haseeb K., Khan S., Jeon G. Computer Communications. 2019;147:188–197.]

9. Ahmed I., Din S., Jeon G., Piccialli F. IEEE Internet of Things Journal. 2019.