Rakshak – Social Distance Surveillance System

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Abstract - *People are asked to limit their interactions with each other, reducing the chances of the disease being spread with physical or close contact.*

So the best way to fight this is to follow the rule of SOCIAL DISTANCING

The Government is working 24/7 to do its best. But, practically they cannot keep an eye on every nook of the city, every store, campus, malls, etc.

There are no tools locally available to keep a track of no. of people following it and analyzing the data. And also to monitor temperatures of people without a volunteer.

Key Words: **Covid-19, Social Distancing, Face masks, Surveillance, Lockdown, Python, YOLO, OpenCV.**

1. INTRODUCTION

The virus that causes COVID-19 is mainly transmitted through droplets generated when an infected person coughs, sneezes, or exhales. If we reduce the infections as much as possible, our healthcare system will be able to handle cases much better, driving the fatality rate down. And, if we spread this over time, we will reach a point where the rest of society can be vaccinated, eliminating the risk altogether.

1.1 Social Distancing

There is one very simple thing that we can do and that works - **social distancing.**

 If people limit their interactions, the spread of the virus will be the least. According to the scientific consensus, the virus can be spread within 2 meters (6 feet) if somebody coughs. So, the normal distance separation between people could be about 1.5 meters.

So, the droplets fall to the ground and don't infect you.

The core importance of social distancing is to reduce contact rates. The impacts of social distancing are quite evident in the data from Wuhan, China.

"Even if you don't reduce total cases, slowing down the rate of an epidemic can be critical,"

2. OBJECTIVE AND GOALS

A.   To detect the violation of social distancing.

B.   To detect people with high temperatures.

C.   Real-time monitoring

D.   To reduce the impact of Pandemic

E.   To analyse the social distancing data.

F.   Quantifying the number of people Not following the distancing rule.

G.   So to ease the work of monitoring the violation of social distancing, we hereby propose this Project.

H.   To mitigate the work of policemen and health-workers

I.   Add-on to the existing surveillance system(CCTVs)

J.   To detect people without face masks and alerting the supervisor.

3. Working

The source feed to the software will be through the existing surveillance systems i.e., CCTVs. At the entrance, the people not wearing masks will be detected and the administrator will be alerted. If the Surveillance system consists of a thermal camera, the people with a temperature above 99 degrees Fahrenheit (or 32 degrees Celsius) will be detected and thereby alerted by the system to the admin. Within the premises of the institution, the violation of social distancing will be detected. The admin will be alerted of the violation, a distance of fewer than 1.5 meters.

   The program also keeps a count of the number of violations.

4. The data analysis

The data collection takes place. The data will consist of timestamps and the number of violations. This data can further be analyzed and reported to the respective institution. The results of the data could be the time intervals when the place is more crowded (so that the admin can manage the no. of people in its area)and how often people are following social distancing. This data can also be used by different analysts. Relevant actions could be taken then. And people would be made more aware of their actions. Thereby, helping improve the mitigation of the virus across the country.

5. Input and output screenshots

   Input:
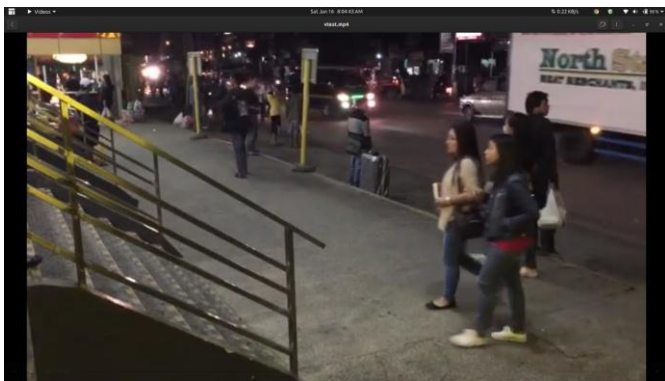
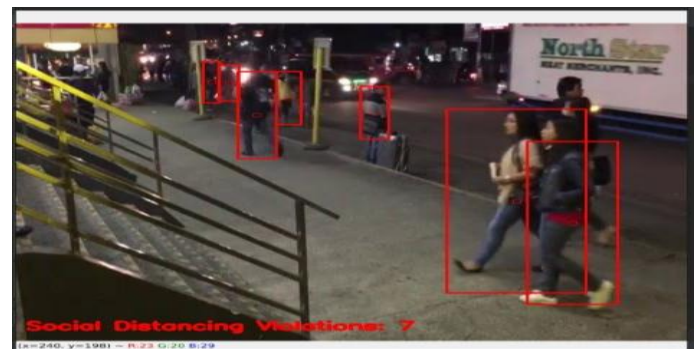   (*Input Source: CCTV footage from the Internet)*

Fig -1: Input

Output:

This is the result obtained after feeding the input source to our program:

Fig -2: Real time Output

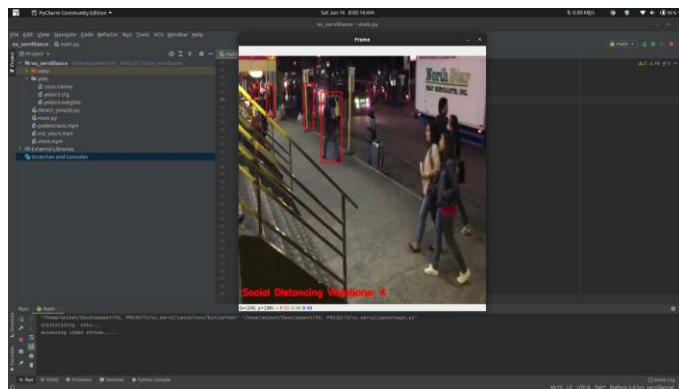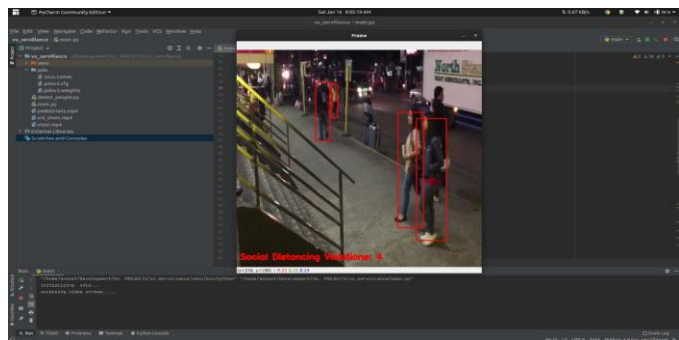**Fig -2**: Real time Output

Fig -2: Real time Output

The program successfully detects the social distancing violations and also counts the live number of violators.

During the running of the program, it also stores the Social distancing violation. Along with the timestamps, for further analysis of this data.

5. Further Advancements

The main idea of the project, which is to check violation of social distancing was achieved months ago. To make it unique and fruitful we tried adding more features, of which the data analysis part was a result.

While thinking about adding more features to our project, we came up with the idea of implementing "Bird's eye view". Bird's eye view will help to create heatmaps, which we further help in analysing which part of the area gets more crowded or at what parts social distancing is violated more. This will help the administrator to inspect the area and come up with an appropriate solution to avoid crowding.

6. Scalability

It can be used to monitor if people are adhering to social distancing or not. It can be used prominently in hospitals, airports, schools, institutions, universities, malls, offices, manufacturing plants, retail shops, libraries, and religious places.

7. CONCLUSIONS

This project is tried and tested. It works successfully.

This project uses YOLO v3, Python, and OpenCV to create the program.
The best thing about this is, it doesn't require any extra equipment. It can be just added to any existing surveillance system. We believe that, if used on a large scale, this project would give us rewarding results in the fight against post-pandemic. content comes here Conclusion content comes here . Conclusion content comes here

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