

Implementing a real-time, AI-based, people detection and social distancing measuring system for Covid-19

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Abstract – Social distancing has been proven as an effective measure against the spread of the infectious Corona Virus Disease 2019 (COVID-19). So An active surveillance system that can detect and force you to follow social distancing can play important role in controlling the pandemic as individuals are not used to maintaining the required 6-feet (2-meters) distance between themselves and their surroundings. Thanks to the improvements in computer vision and deep learning. With the help of Open Source Computer Vision library (OpenCv) & You Only Look (Yolo), this tool detects humans in frame and by measuring respective distances it checks if social distancing is followed or not. This is low-cost system connected to camera feed and suitable for every location. Automated surveillance system inspects the footage generated by CCTV cameras. It will generate an alert every time social distance norms are not followed. It can further be integrated with apps like Aarogya Setu and smart watches and can alert people about situation at particular area. It can be very useful for places like railway stations, airports, megastores, malls, streets, etc.

Key Words: Social Distance detection, Human Detection, distance, CCTV, alert

1. INTRODUCTION

1.1 Purpose

We are not going to discuss the medical background of COVID-19 neither we are going to discuss the history of COVID-19. The primary focus of our work is to warn the people when they knowingly or unknowingly cross the limit that is 6 feet or 2 meters.

Social distancing is considered the best along with mask to reduce spread in the present scenario, and all affected countries are locked-down to implement social distancing. So, we aimed to support and mitigate the corona virus pandemic along with minimum loss of economic endeavours, and propose a solution to detect the social distancing among people gathered at any public place.

1.2 Objective

The main objective of our system is as follows: -

- To reduce transmission,
- Delaying the pandemic peak,
- Reducing the size of the pandemic peak, and
- Reducing cases to relieve pressure on the healthcare system.

1.3 Existing System

Corona kavach -The app tracks the data of the user every hour to alert them whether they have crossed paths with any person who tested positive for corona virus. It was discontinued by the Government of India.

Arogya Setu App - Currently India is using GPS to track the movements of the suspected or infected persons to monitor any possibility of their exposure among healthy people. For this, they are using the Arogya Setu App, it helps others to keep a safe distance from the infected person.

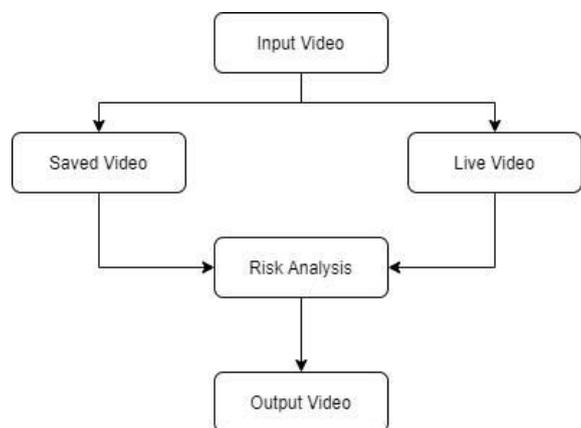
This app is an updated version of an earlier app called Corona Kavach.

1.4 Technology and Development Environment

The tool uses Open Source Computer Vision library (OpenCv) and You Only Look Once (YOLO V3) in Python environment.

1.5 Modules of the system

The social distancing detection system consists of following modules:



- Bifurcations of the frames are done into different zones.
- Then the systems generate results and risk for the captured video.

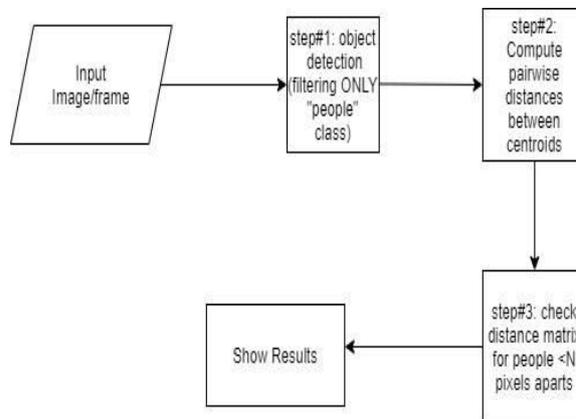


Fig. 2.1 Overview of the system

2. System Feasibility Analysis

2.1 Economic Feasibility

Following are the points that determine that our project is economically feasible: -

- Being a software social distancing detector will have an associate hosting cost.
- Addition cost required for resources like screen.
- Hence, this project social distancing detector is financially feasible.

2.2 Technical Feasibility

Technical Requirements of our project: -

- Software Requirement: -
A system with any python IDE.
- Hardware Requirement: -
A system with 4GB RAM.
Requires additional webcam if not already present in the system.

3. IMPLEMENTATION

1. Import: Imported required libraries i.e. Open CV and Yolo.
2. Software Program: Here we are using Python language in Visual Studio.
3. Algorithm:
 - The system will capture the video from the camera.
 - The frames will be generated through the captured video film for the further analysis.
 - Analysis on the video will be made based on given data (Values of distance for red, green, yellow).

4. Result

The following figures show the output as captured by CCTV with people at high, low and no risk.



5. CONCLUSIONS

This research presented an intelligent surveillance system for people tracking and social distancing classification based on images. The proposed technique achieved promising results for people detection. A specific algorithm was implemented on bounding boxes to distinguish between safe and unsafe

conditions, respectively, marking as green, yellow and red the bounding box for detected persons. The proposed technique showed better results for real-time performance.

REFERENCES

- <https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003244>
- <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9138385>
- <https://app.diagrams.net/>
- <https://www.researchgate.net/publication/342853201>
The Visual Social Distancing Problem