International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 08 Issue: 05 | May 2021 www.irjet.net p-ISSN: 2395-0072

Social Distancing Detector for prevention of Covid-19

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Abstract - *The collision of the COVID-19 pandemic is drastically changing the lives of people, including the young generation. Educational centers have closed, exams and events are postponed, the usual health services are limited at most of the hot spots, socializing is out of the thought and in some places even punishable at this point such system fits perfectly to control the spreading of this deadly virus among us when we are out in public. Going through in these circumstances can be tough for young people for their social, physical and mental wellbeing.*

This new COVID-19 Youth Guide is a collection of important resources that can help young people to steer their lives in these challenging times as well as motivates them to stand as a leaders in dealing with the uncertainty of this pandemic

Key Words: COVID-19, SOCIAL DISTANCE, IMAGE PROCESSING, INDUSTRIES, AI, PYTHON

1. INTRODUCTION

"Internet of Things". The term "The Internet of Things" (IoT) was cast by Kevin Ashton in a presentation to Proctor & Gamble in 1999. He also introduced Zensi, a company that makes energy sensing and monitoring technology. We would fathom when things required restoration, redesign or renew, and whether they were brazen or past their best."

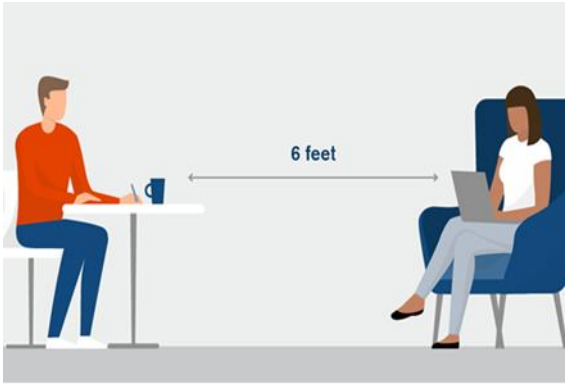

Fig -1: Social Distancing

Then Raspberry Pi was begun Raspberry Pi is a midget card sized computer established in the United Kingdom by the Raspberry Pi Foundation. Their main motive was to help & promote the teaching of basic computer science in schools and in developing countries. Far more than expected, it did wonders in many streams, such as robotics. More than 5 million Raspberry Pi's have been sold before February 2015, according to the Raspberry Pi Foundation. CPU rate scals from 700 MHz to 1.2 GHz for the Pi 3 & has 1 GB of RAM For de-escalated verbmake result it has a count of GPIO pins which uphold prevalent obligation like I^2C. Pi 3 is also furnished with Wi-Fi 802.11n and Bluetooth. It is used for different purposes. It could be useful as a general computer, for browsing the internet, playing HD videos, making spreadsheets & word-processing or playing games. But presently it is chiefly being used for forming IoT plan like infra-red cameras, security systems, music machines & detectors for weather stations. As we earlier discussed, Raspberry Pi is getting immense popularity in the field of robotics due to its small size and good processing power required for standalone systems.

The Raspberry Pi framework endorse the wield of Raspbian, a Debian-based Linux OS.

1.1 Artificial Intelligence

In today's time, tech world is growing in blinking speed, and we are getting to know with new things in this stream day by day. Here, one of the successful technologies of computer science is AI which is ready to create a new revolt in the world by making bright tools. The Artificial Intelligence is now in every stream. At this spike it's running with a mixture of subfields, vary from general to fixed, such as self-driving cars, playing chess, proving theorems, playing music, Painting, etc. AI is one of the adopting and universal fields of Computer which has a big scope in future. AI is known for making a machine that works as a human.

Fig - 2: Artificial Intelligence

1.2 Python

Back in 1991, the Python programming language was known as a sift, a way to generate scripts that "automate the boring stuff" (as one popular book on learning Python put it) prototype app i; then, over the past few years, Python is seen first citizen in today's software development, infrastructure management, and data analysis and other main streams. It is no longer a old-rack utility language, but a big patron in web application creation and systems administration, and a key driver of the outburst in big data analytics and AI.

1.3 OpenCV

OpenCV (Open Source Computer Vision Library) is an open source machine tunnel and machine swotting software library. OpenCV was introduced to bring a basic framework for computer perception and to increase the use of tool perception in the commercial products. Being a BSD-licensed production, OpenCV makes it effortless for businesses to cover and rework the code. OpenCV has more than 2500 refurbish algorithms, which cover a extensive set of both classic and state-of-the-art computer vision and machine learning algorithms. These algorithms can be used to reveal and apprehend faces, identify objects, classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects, produce 3D point clouds from stereo cameras, stitch images jointly to build a high resolution image of an entire scene, find alike as images from an image database, remove red eyes from picture captured using flashlight, go after eye gesture, perceive scenery and implementing markers to cover it with augmented reality, etc. OpenCV has further than 47,000 people of user circle and evaluated counts of downloads rough 18 million. The library is used I large numbers in companies, research centers and by government bodies.

1.4 YOLOV3

YOLOv3 (You Only Look Once, Version 3) is a coexistent object detection algorithm that inspect certain objects in videos, live feeds, or images. Versions 1-3 of YOLO were fathered by Joseph Redmon and Ali Farhadi. The first version of YOLO was created in 2016, and version 3, which is deliberated utterly in this article, was made two years later in 2018. YOLO is enforced using the Keras or OpenCV deep learning libraries. Object classification systems are used by Artificial Intelligence (AI) programs to grasp specific objects in a class as subjects of interest. The systems sort objects in images into groups where objects with similar characteristics are placed together, while others are oversight unless programmed to do otherwise.

2. PROBLEM DEFINITION

Social distancing has been proven as an effective step against the spread of the contagious Corona virus (COVID-19). However, especials are not used to path the required 6-feet (2-meters) distance between themselves and their surroundings. This project is skilled of detecting distances between spreate and forewarning them can slow down the spread of the deadly disease. Furthermore, measuring social density in a region of interest (ROI) and modulating inflow can decrease social distancing violation occurrence chance and a Social Distancing Detector for prevention of Covid-19 fits.

3. REQUIREMENTS

- Raspberry Pi
- Power supply
- Raspbain os
- Python 3
- Microsoft Power point

4. WORKING

By using OpenCV. and Raspberry Pi. We'll be applying the weights of the YOLO v3 Object Detection Algorithm with the Deep Neural Network module. Raspberry Pi is without fall a quality option for Image processing projects as it has more space and speed than other controllers.

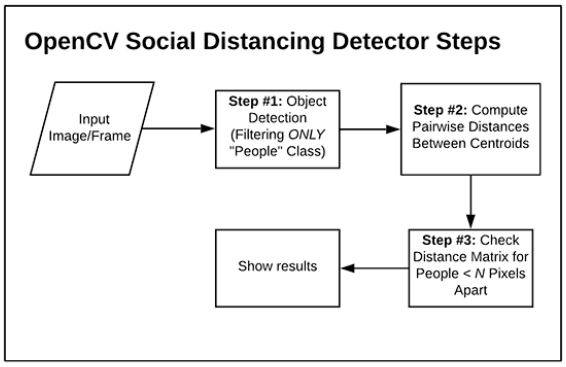

Fig - 3: OpenCV steps

For the most meticulous results, you should calibrate your camera through intrinsic/extrinsic parameters so that you can outline pixels to measurable units .An easier alternative (but less accurate) technique would be to apply triangle affinity evaluation. Both of these technique can be used to map pixels to calculable units. Finally, if you do not want/cannot apply camera evaluation, you can still use a

social distancing detector, but you'll have to rely purely on the pixel distances, which won't unquestionably be as accurate. For the sake of modesty, our OpenCV social distancing detector execution will rely on pixel distances .

All the models are at hand on the Tensorflow object detection model zoo have been upskill on the COCO dataset (Common Objects in COntext). This dataset contains 120,000 images with a total 880,000 classify objects in these images. These models are skilled to detect the 90 different types of objects labeled in this dataset. A outright list of all this various objects is available in the data part of the repository accessible on the data section of the github repo.

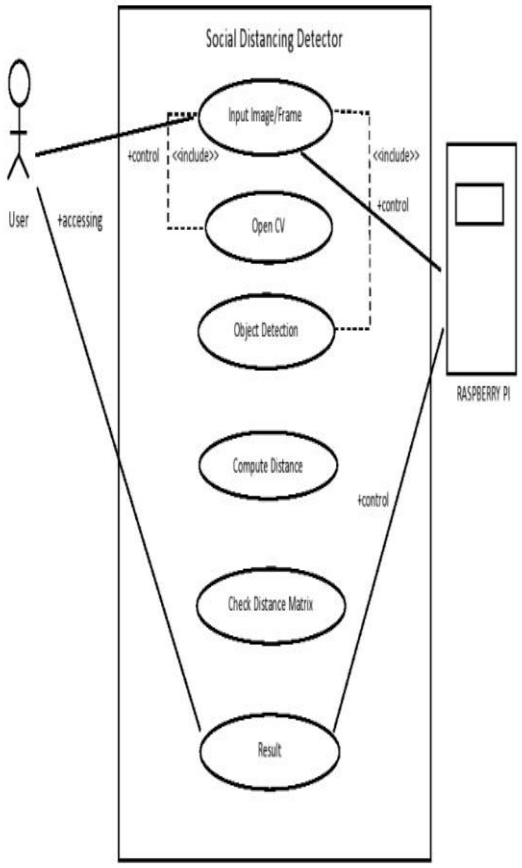

Fig - 4: Use case diagram

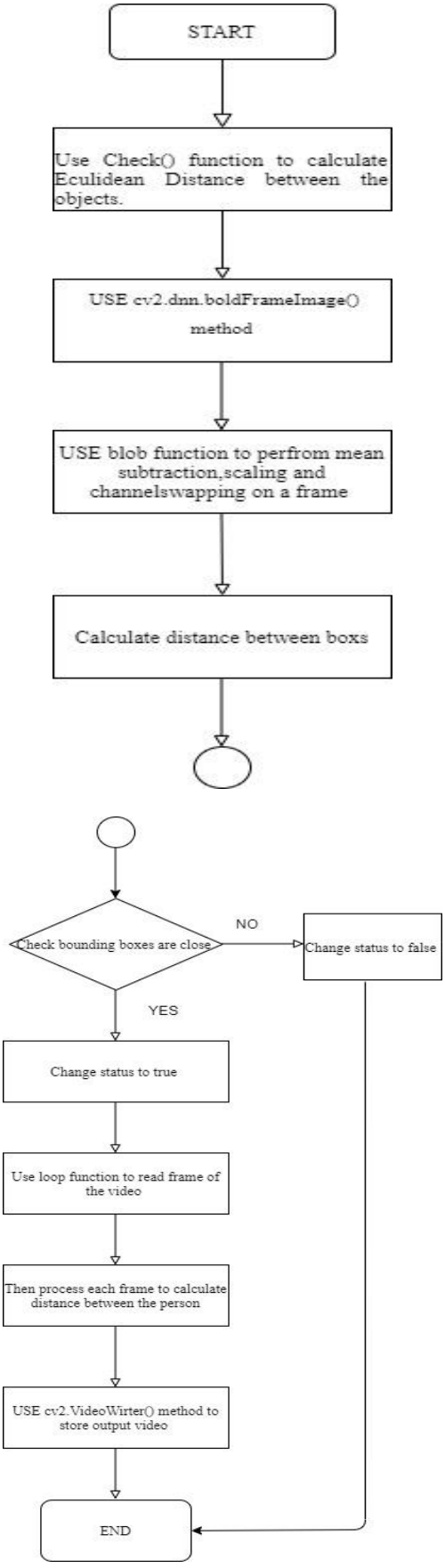

Fig - 5: Flow chart

5. ADVANTAGES

As nothing is predicted about this widely spreading virus no one knows when this is gonna end. We can apply this project in a lot of fields such as at police station, at School and colleges for attendance and in complexes for access grant. This project can be useful in every field where humans are present with the help of this project keeping a proper distance can be very easy of the back-end operator, At the out-turn, the model present the data about the total number of social distancing breach across with detected people vault boxes and centroids. In this slog, YOLOv3 is used for human detection as it tweak prophetic perfection, very for modest objects.

With the detection software you will have the aptness to see which areas gain the highest drag and are the offices 'hotspots. From this figures you will then be able to put the utmost apropos safety counts in place.

The system isn't just for the office, for example, at a factory where employees are very close to each other, the software can be installed into their security camera network. granting them to monitor the working surrounding and peak people whose distancing is below the least appropriate distance.

6. CONCLUSION

With a clear objective of Social Distancing Detection Covid-19 can be prevented as this is one of the solutions. This system projects very energetically and efficiently in spot the social distancing between the people and bring about the signal that can be control and monitored. Therefore, we see that this system can be an innovative step to be adapted in our daily usage.

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