

Assignment on OpenCV

person detrection, assiging id to each person,mask detection and tracking social disytance.

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# Person detection and Assigning Id to each person.

* For detecting the person first I imported the module and the classes required for the classification and detection of objects.
* First read the file frame by frame and then resize the frame.
* Converting the frame to the blob and passing it to the detector.
* Then do the detection calculate the height and width and make the rectangular blob around that using blobFromImage() and pass the parameters as frames.
* The person is detected and now we will iterate through for loop for displaying the frame and append that person’s boxes to the list.
* For increasing the accuracy of the rectangular blob we need to use in non\_max\_suppression algorithm for showing only one accurate blob.
* Create the bounding boxes and Pass all the bounding boxes to the non\_max\_suppression function with some threshold value
* Pass that person’s list to the tracker and create objects.
* User for loop for getting the object id and that particular boxes
* Display the rectangle for the bounding box and put the assigned id for that box or object
* Use putTextmethos for displaying the id on the box.

## Social distnce tracking

1. For social distance

Detect person based on boundary box detect centroid and after that assign each centroid for each person

* 1. calculate the distance between 2 centroids if this distance is less than some threshold value then mark it as a red zone and display please maintain social distance
  2. if the distance is greater than the threshold then assign a green box, this means social distancing is true.
  3. Methodology
     1. assign object for centroid as cx and cy in tracker objects and save them to dictionary
     2. centroid dictionary contain the centroid points cx and cy and the blob of that person these is x1,,y1,x2y2
     3. Create other for loop to iterate through the centroid dictionary. And import combination form itertool these will create the combination between those detected persons.
     4. Now calculate distance between 2 person for that import math

Distance =math. square root of (distance x multiply by distance x) add (diatance x multiply by distance y)

Define threshold value and declare zones for them and print to maintain social distance.

## FPS (Frame per second)

For frames per second declare the start and end time and initialize them by zero.

Now find the time difference by end time minus start time.

if time\_diff.seconds is = 0 then frame per second=0

else frame per second is equal to(total\_frames / time\_diff.seconds)

Now just display the frame per second count by the putText method.

**As I am running from an opening environment we have to initialize that otherwise no need to do it**

**For the detector initialize them by INFERENCE Engine at the back end and give the hardware used list I am using the cpu.**

**Show output by some testing video.**