IIP PROJECT REPORT

# Introduction:

Coronavirus disease 2019 (COVID-19) is an emerging respiratory infectious disease caused by Severe Acute Respiratory Syndrome coronavirus 2 (SARS- CoV2) . Currently, COVID-19 has quickly spread to the majority of countries worldwide, affected more than 24 million individuals, and caused nearly 842,000 deaths, according to the report of the World Health Organization (WHO) on the 29th of August, 2020.There are so many essential equipments needed to fight against Coronavirus. One of such essentials is Face Mask.

# Abstract:

After the new Coronavirus disease (COVID-19) case spread rapidly in Wuhan-China in December 2019, World Health Organization (WHO) confirmed that this is a dangerous virus which can be spreading from humans to humans through droplets and airborne. As for the prevention, wearing a face mask is essentials while going outside or meeting to others. However, some irresponsible people refuse to wear face mask with so many excuses. Moreover, developing the face mask detector is very crucial in this case. This project aims to develop the face mask detector which is able to detect any kinds of face mask. In order to detect the face mask deep learning has been chosen as the mask detection algorithm. From the experimental results, this device is able to detect the people who wear or do not wear the face mask accurately even if they are moving to various position.

# DESIGN AND IMPLEMENTATION:

This project uses a Deep Neural Network, more specifically a Convolutional Neural Network, to differentiate between images of people with and without masks. The CNN manages to get an accuracy of 98.2% on the training set and 97.3% on the test set. Then the stored weights of this CNN are used to classify as mask or no mask, in real time, using OpenCV. With the webcam capturing the video, the frames are preprocessed and and fed to the model to accomplish this task. The model works efficiently with no apparent lag time between wearing/removing mask and display of prediction.

|  |
| --- |
| while cap.isOpened(): |
|  | \_,img=cap.read() |
|  | face=face\_cascade.detectMultiScale(img,scaleFactor=1.1,minNeighbors=4) |
|  | for(x,y,w,h) in face: |
|  | face\_img = img[y:y+h, x:x+w] |
|  | cv2.imwrite('temp.jpg',face\_img) |
|  | test\_image=image.load\_img('temp.jpg',target\_size=(150,150,3)) |
|  | test\_image=image.img\_to\_array(test\_image) |
|  | test\_image=np.expand\_dims(test\_image,axis=0) |
|  | pred=mymodel.predict(test\_image)[0][0] |
|  | if pred==1: |
|  | cv2.rectangle(img,(x,y),(x+w,y+h),(0,0,255),3) |
|  | cv2.putText(img,'NO MASK',((x+w)//2,y+h+20),cv2.FONT\_HERSHEY\_SIMPLEX,1,(0,0,255),3) |
|  | else: |
|  | cv2.rectangle(img,(x,y),(x+w,y+h),(0,255,0),3) |
|  | cv2.putText(img,'MASK',((x+w)//2,y+h+20),cv2.FONT\_HERSHEY\_SIMPLEX,1,(0,255,0),3) |
|  | datet=str(datetime.datetime.now()) |
|  | cv2.putText(img,datet,(400,450),cv2.FONT\_HERSHEY\_SIMPLEX,0.5,(255,255,255),1) |
|  |  |
|  | cv2.imshow('img',img) |
|  |  |
|  | if cv2.waitKey(1)==ord('q'): |
|  | break |
|  |  |
|  | cap.release() |
|  | cv2.destroyAllWindows() |