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REAL TIME FACE MASK DETECTION AND SOCIAL DISTANCING

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Abstract - worldwide epidemic COVID- A worldwide pandemic of a severe disease developed 19 conditions. The individual won't catch any airborne contagious germs by wearing a face mask, but it will assist stop the spread of infection. One can keep an eye on whether or not people are wearing masks by using a face mask detection system. The HAAR-CASACADE method is utilised here to detect images. Combining this classifier with other current methods yields a good recognition rate even with varying expressions, effective feature selection, and a small number of false positive features. Only 200 out of 6000 features are used by the HAAR feature-based cascade classifier method, which results in an 85–95 percent recognition rate. In light of this motivation, we call for mask detection to be implemented as an innovative public health care system during the.

Key Words: COVID-19 epidemic, HAAR-CASACADE algorithm, mask detection, face mask image, non-face mask image

1.INTRODUCTION

The vaccine that can effectively treat Covid-19 has not yet been developed, and the globe has not yet fully recovered from this epidemic. However, numerous governments have permitted a small number of economic activities to be resumed once the number of new cases of Covid-19 has decreased below a particular level in an effort to lessen the pandemic's impact on the nation's economy. Concerns about workplace safety in the new post-Covid-19 climate have surfaced as these nations cautiously resume their economic activity.

2. RELATED WORKS

[1] This work is done by author Mrs.B.Siva Jyothi1 , P.Rushitha, B.Chandu, M.Raja Sekhar , B. Manoj "FACE MASK DETECTION SYSTEM USING DEEP LEARNING"

Pandemic on a global scale COVID-19 An epidemic of hazardous sickness erupted in 19 countries throughout the world. Wearing a face mask can help reduce the spread of infection and the transmission of infectious germs through the air. Face Mask Detection System can detect whether or not people are wearing masks. For image detection, the Haar-Cascade method is utilized. This classifier, when combined with other current algorithms, produces a high recognition rate even with varying expressions,efficient feature selection, and a low number of false positive features. The Haar feature-based cascade classifier method uses only 200 characteristics out of 6000 to achieve an 85-95 percent recognition rate. We require mask detection as a unique and public health service system during the global pandemic COVID-19 outbreak based on this rationale. Face mask and non-face mask images are usedto train the model

[2] This work is done by M. S. Ejaz and M. R. Islam, "Masked Face Recognition Using Convolutional Neural Network," 2019 International

In a Smart City Network, an Automated System to Limit COVID-19 Using Facial Mask Detection[1]: COVID-19, apandemic caused by a novel coronavirus, has been spreading over the world for a long time. COVID-19 has had an impact on practically every aspect of development. The healthcare system is in a state of emergency. Wearing a mask is one of the many preventative steps adopted to minimize the spread ofthis disease. In this paper, we will look upon

In a smart city network where all public places are monitored by Closed-Circuit Television (CCTV) cameras, we propose a technique to limit COVID-19 growth by identifying people who are not wearing any facial mask. When a person withouta mask is spotted, the city network notifies the appropriate authority. A dataset of photos of people with and withoutmasks acquired from diverse sources is used to train a deep learning architecture. For previously unreported test data, the

trained architecture distinguished people with and without a facial mask with 98.7% accuracy

[3] M. M. Rahman, M. M. H. Manik, M. M. Islam, S. Mahmud and J. -H. Kim, "An Automated System to Limit COVID-19 Using Facial Mask Detection in Smart City Network," 2020 IEEE International IOT,

Electronics and Mechatronics Conference (IEMTRONICS),2020

Face Recognition using a Masked Convolutional Neural Network In recent years, face recognition has become a popular and important technique. Face changes and the use of several masks make it far too difficult. Masking is another prevalent case in the real world when a person is uncooperative with equipment, such as in video surveillance. For these masks, current face recognition The quality of the work suffers. A large number of studies have been conducted on recognizing faces in a variety of situations, such as shifting stance or light, degraded photos, and so on. Nonetheless, the challenges posed by masks are sometimes overlooked. The main focus of this research is on facial masks, specifically how to improve the recognition accuracy of various masked faces. A workable strategy has been developed, which involves detecting the facial regions first. A Multi-Task Cascaded Convolutional Neural Network was used to solve the obstructed face identification problem (MTCNN). The Google FaceNet embedding model is then used to extract facial traits

3. PROPOSED SYSTEM

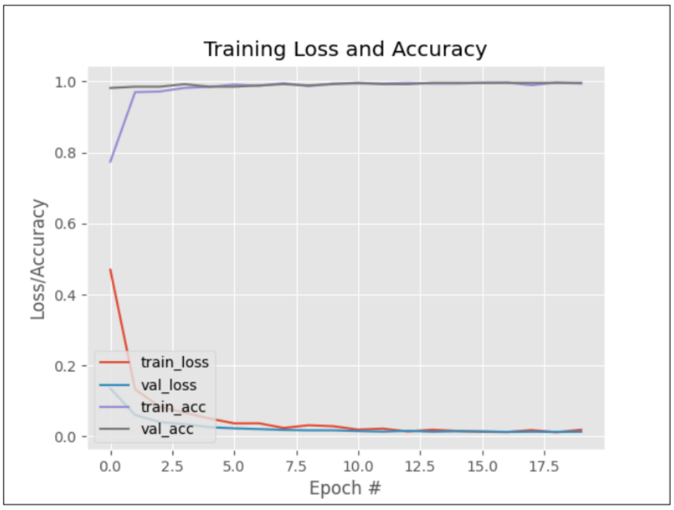
Both datasets of people wearing masks and those who aren't can be used to train this system. Following model training, the system can determine if a person is wearing a mask or not. It can also access the webcam and forecast the outcome. The proposed system focuses on using computer vision and deep learning algorithms to recognise people wearing face masks in picture and video streams. It does this by utilising the OpenCV, Tensor Flow, Keras, and PyTorch libraries.

3.1MODULES:

1. Training the model
2. Detection of model
3. Main module MOHANASUNDAR P, MANOJ KUMAR V, KISHORE R, BALAJI S

MODULE 1: Training the model

Import all required libraries modules for this training script. TensorFlow functions, keras, Scikit Learn, imutils, matplot construct the argument parser and parse the arguments in the command box Use of scikit-learn aka sklearn for binarizing class labels, segmenting dataset and a printing a classification report. By imutils paths implementation will help to find and list images in dataset, and use of matplotlib to plot training curves



MODULE 2: Detection of model

Import all required libraries and one selfmade module known as .conf. this python file contains some global values like NMS_THRES – threshold value, MIN_CONF, People_Counter at same path This Module detection.py is made for to count the total persons in a frame and returns total number to output display

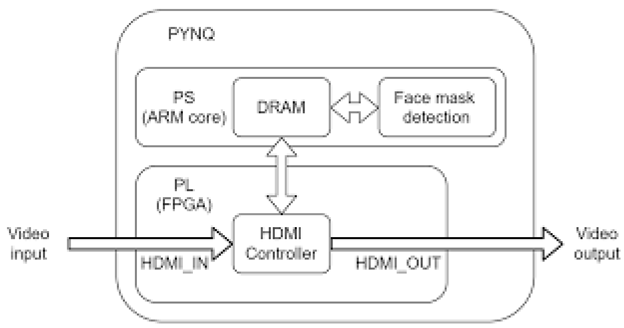
MODULE 3: Main Module

There is a file called coco.names (Pre-Trained model) that has the list of 80 object class that the model will be able to detect. The model has been trained only on these 80 object classes. Call and Open pre-trained model (Lines 12-13), similarly set path of YOLO Version3 pre-trained weights of neural network i.e. .weights and neural network architecture model i.e. .cfg file to weightsPath and ConfigPath respectively (Line 20-21). readNetFromDarknet returns Network object that ready to do forward, throw an exception in failure cases(Lines 23), and to assign the pixel values in relation to the threshold value is 0.4. To Start the videoStreaming set the path of Camera main camera value is '0' for System inbuilt Camera, and to connect with other out source of camera such as external camera like CCTV and webcam set the value in VideoCapture() is 1,2.. as the no. connected of cameras. Start VideoStreaming to load real-time images to detect the face and check to maintain social detecting. After Video Streaming it set size of output windows to 720x640 and for analyzing an image that has undergone binarization processingsuch as the presence, number, area, position, length, and direction of lumps (Lines 44-61)

4. ARCHITECTURAL AND DATAFLOW DIAGRAM

4.1ARCHITECTURAL DIAGRAM:

The architectural diagram consists of Network dataset which the dataset undergoes process of data cleaning, null detection. Then the dataset is preprocessed and the dataset is now spitted 70 percentages for training and 30 percentages for test the model by using the decision tree and Tensorflow classifier the model is trained and 30 percentage data is for the prediction to test the accuracy.



4.2DATAFLOW DIAGRAM:

Data Visualization

In the first step, let us visualize the total number of images in our dataset in both categories. We can see that there are ***690*** images in the '***yes***' class and ***686*** images in the '***no***' class.

Data Augmentation

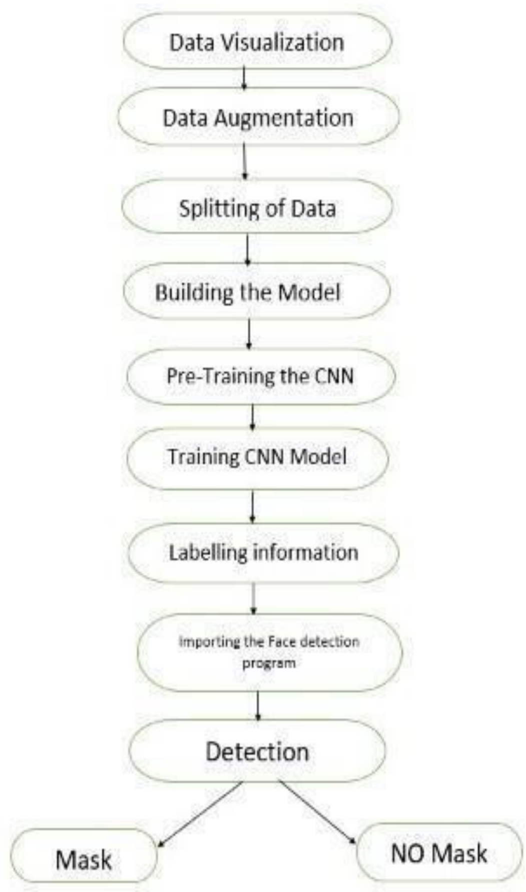
In the next step, we ***augment*** our dataset to include more number of images for our training. In this step of *data augmentation*, we *rotate* and *flip* each of the images in ourdataset.

Splitting the data

In this step, we ***split*** our data into the ***training set*** which will contain the images on which the CNN model will be trained and the ***test set*** with the images on which our model will be tested.

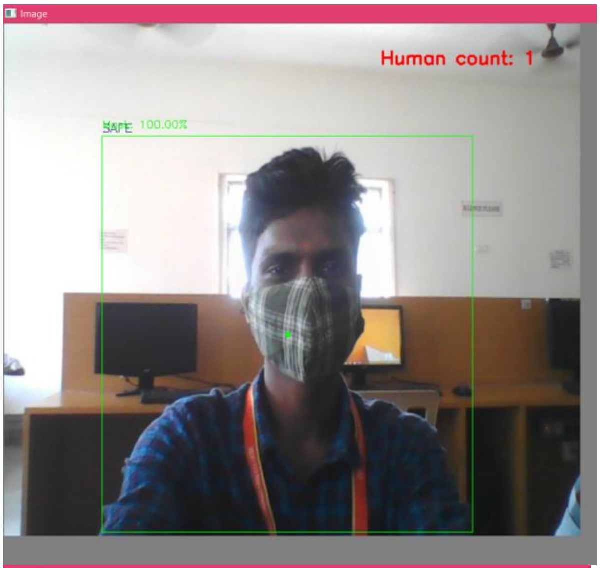
Building the Model

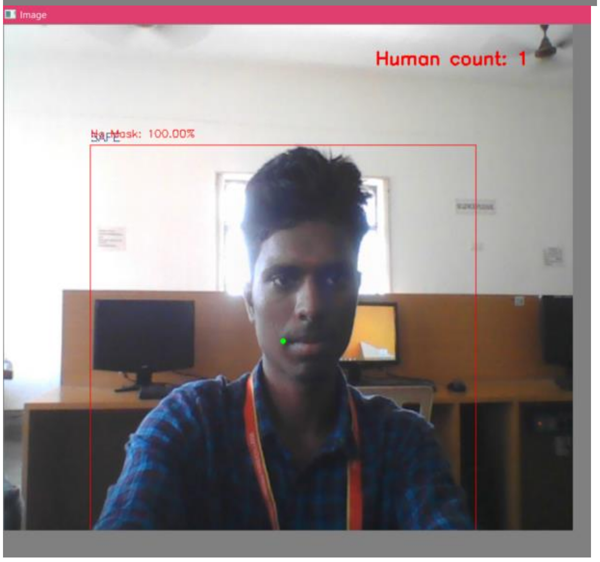
In the next step, we build our Sequential CNN model with various layers such as *Conv2D, MaxPooling2D, Flatten, Dropout* and *Dense.*



5.RESULTS AND OBSERVATIONS

The recognition accuracy of Jingdong exceeds 99 percent. TheMFDD, RMFRD, and SMFRD datasets, as well as a cutting- edge algorithm based on them, were developed by us. In scenarios such as community access, campus governance, and enterprise resumption, the algorithm will provide contactless facial authentication. Our research has strengthened the scientific and technological capabilities of the planet.





6.CONCLUSION

We now have a revolutionary face mask detector thanks to the availability of emerging trends in technology, which may help improve public healthcare. Mobile Net serves as the foundation of the architecture, which may be applied to both high- and low-computing scenarios. We use transfer learning to adopt weights from a related task, face detection, which is learned on a very large dataset, in order to extract more robust features. To determine whether or not people were wearing face masks, we used OpenCV, tensor flow, and NN. Images and live video broadcasts were used to evaluate the models.

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