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Face Mask and Social Distance Detection Using Deep Learning

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ABSTRACT

According to the World Health Organization, the global COVID 19 pandemic had a profound impact on the world, infecting more than eight million people worldwide. Wearing face masks and maintaining a safe community distance are advanced safety measures to consider in public places to prevent the spread of the virus. It uses leisure tracking and fashion trends to achieve public safety and face masks at all levels in public places, Use digital digital camera breach to create a safe environment that contributes to social protection. If a violation is found, the output will produce a result.

Keywords – Face Mask, Covid-19, Social Distancing, CNN.

I. INTRODUCTION

to The COVID19 pandemic epidemic has caused a severe global health crisis and has had a profound impact on people's perceptions of humanity, our world, and their daily lives. The novel coronavirus caused human-to-human transmission, but as far as we know, the novel coronavirus infection causes coronavirus disease 2019 (COVID19) also occurs in asymptomatic carriers who will not show Covid symptoms. There is a big chance of its moving fast and all. It is rapidly spreading throughout the world and poses significant health, economic, and security risks. Social challenges for the whole population. Currently, WHO recommends wearing a mask to avoid the risk of viral infection, a distance of at least 2m is recommended to prevent the spread of the disease to individuals, and many public service providers require customers to wear masks and only use the service at a safe social distance. Therefore, mask detection and safe social distancing have becomeimportant tasksin computer vision to support the global community.

II. EXISTING METHOD AND MATERIAL

Presented study the current system for person detection uses rigid cascade and pig Christo gram gradient, so if the person scale is changed or the dot direction is changed, the person cannot perceive the image. Therefore, you can further improve performance by using better sampling strategies and more advanced data expansion techniques. Our approach uses a benchmark deep neural face recognition dataset to demonstrate this. An entirely unique corona virus resulted in human-to-human transmission, but as far as we know has been hastily circumvented around the world and has brought enormous health, economic, environmental and social afflictions to human communities. WHO

recommends that people wear face masks to avoid the risk of virus transmission, and also maintain a distance of at least 2m between persons to prevent person-to- person transmission of the disease. Current systems use templates for template detection; however, however, in our approach, we use Trained CNN, which creates its own feature, for instance, An individual`s form or coloration changes, it's going to come across it and enhance the accuracy of the detection; thus, the usage of CNNs will probable lessen the estimation mistakes in comparison to the multiclass type approach.

III. PROPOSED SYSTEM APPROACH

A. Social Distance

In fig.1 in this we use camera in this whatever the video is coming through the camera we'll convers it to the frames. After converting into the frames there are 25 frames in 1 sec. so one by one we'll process. Now whatever frames comes up 1st we'll apply median filter on it. Sometimes what happens because of illumination intensity some of image is increased noise. So whatever the increase intensity is there we suppress through median filter. Whatever the image is filter through median we need to detect the person. So come across the character there need to be a few structure present.Now we train the DNN for person. For example, photos, or crop photos we give it to that accordingly he'll get train. That called is as person image data segment. (Means if we give crop images of person he'll see the person place and learn by itself. Whatever the output we get the median filter apply on that image whatever the train person available. It'll create bounding box. Once we get the bounding box, what it'll do is it'll calculate the distance from one bounding box to another bounding box. If one bounding box is there, then there we'll be no problem. If there are multiple bounding boxes, then individual bounding box distance will be regenerated. If the distance is 3 meter. But in the image it'll won't be 3 meter. For that what we do is 3 meter means how much pixels. That what we calculate. It's called as camera calibration. Means if there is an angle, according to the angle to pixel with respective real life distance it is used. Because of it is 1 pixel or how much pixel is available in 1 meter it is calculated. If distance is about 3 meter or 3.1 meter we give it orange, if is above 3 meter then we give red color to the box. According to that we generate warning.

B. Face Mask

Now 2nd part is detecting the face mask. Whatever the frame is there in this we are goanna see the face as well. For detecting the face there is voila and jones algorithm. Now after detecting the face what we'll do is we'll check is there mask present o face or not. For checking the mask is present or not we'll train the module as well. (Like mask shape). So we'll use different images of masks from internet and it'll get train. Whenever on your face or image if there is specific shape of mask or related texture is present or not, if possible fount if not then it'll generate warning .it" generate a pop-up that face mask is absent.

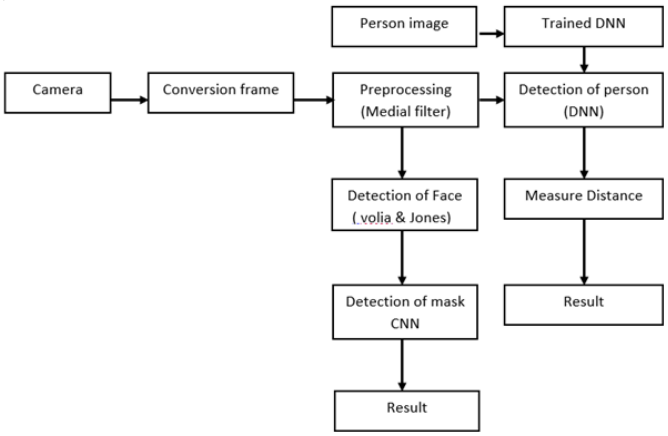

Fig.1 System Architecture of Proposed System

C. Algorithm Used:

Convolutional Neural Network (CNN):-

In the proposed work, we use CNN with image frames as input. After obtaining frames from a picture, they're going to be processed for feature evaluation using image processing techniques. Extract the

various features from those images, even if the events inside them. We will identify unusual phenomena using a series of mathematical tasks. Each level in CNN is able to determine the image weight by metric evaluation, which converts the input into output with useful functions. CNN layers are not able to identify fire events from extracted frames and predict with high accuracy and in a short time.

Step 1-Input food image
Step 2- Frame extraction from images
Step 3- Image processing by using open-cv
Step 4- Feature Extraction from images
Step 5- Model generation
Step 6- Nutrition detection

IV. RESULT & DISCUSSION

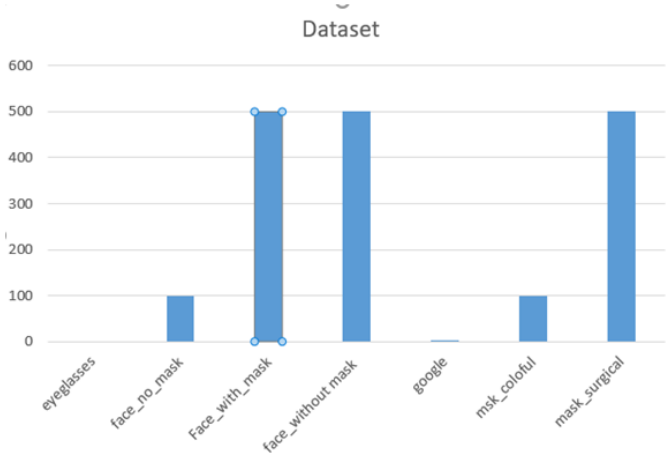

Fig. 2 Count of dataset

The dataset utilized in this project is a Face dataset (with/without mask dataset) from Kaggle.com.
Images with a mask: 500,
images taken without a mask: 500
Dataset is that the major part for building the CNN model.

Fig. 3 Result Of Social Distancing

The Euclidian distance method is used to calculate social distance. It computes the space among gadgets primarily based totally on their centroid. It uses the focal length of the virtual digital camera lens as a parameter to calculate distance This method calculates distance in centimetres rather than pixels, allowing for more accurate comparison and precision because 6 feet is equivalent to 182.6 cm. Taking Photographs of the Frames The system records the frames that indicate a violation of social distancing and saves them in a directory with the current date so that they can be viewed for further analysis.

$$d(x,\ y)\ =\ \sqrt{\sum_{i=1}^{n}(y_i - x_i)^2}$$

Fig. 4 Euclidian Distance formula

The model`s output fits what become expected. Mask detection is carried out the use of the digital digicam as a medium to offer correct results. When a person's face is detected withinside the digital digicam body, an inexperienced or crimson body seems over the face. A character who isn't always sporting a masks may have a crimson body over his face with inside the digital digicam, whereas a person who is wearing a mask will not have a red frame. A percentage match can also be seen at the top of the result frame.

V. CONCLUTION

To assist maintain a secure weather and assure human beings coverage through obviously staring at public spots to stay away from the unfold of the COVID-19 contamination and assist police with the aid of using proscribing their real reconnaissance paintings in law zones and public areas wherein remark is wanted with the aid of using strategies for digital looks after with raspberry pi4 step by step. Subsequently, this proposed framework will paintings in an efficient manner with inside the contemporary situation we have tended to pinnacle to backside recognizable evidence of face coverings that help to secure human health after social emancipation. The execution of this association changed into successfully attempted step by step with the aid of using sending version in raspberry pi4. The association can likely altogether reduce infringement with the aid of using non-stop intercessions, therefore, the proposed framework can increase public protection by saving time and supporting the reduction of the spread of Covid. The gadget can also override an alert reminding people to maintain a safe distance if protocol is violated. Man or woman is masked. This association can be used in sanctuaries, purchasing complex, metro stations, air terminals etc.

VI. REFERENCES

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