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FACE MASK DETECTION USING YOLO

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A B S T R A C T

The idea of our challenge is to maintain Social Distance among human beings and to check Face Mask on face of peoples inside angle the time of COVID-19. This model can be detecting real time Face mask and Social Distancing which can be actually essential in this epidemic situation. Since all the associations, boards and workplaces which can be closed now will restart quick and they'll be looking some generations to be steady and healthy.

Keywords:Tensorflow, OpenCV, numpy, sklearn, Imutils and YOLOv3.

INTRODUCTION

COVID-19 belongs to the family of coronavirus caused conditions, firstly reported at Wuhan, China, in late December 2020. On March 11, it covers 114 countries with active cases and 4000 deaths, WHO declared this a epidemic. On November 18, 2020, over cases and deaths had been reported worldwide. The alternate swell of covid in 2021 April came severe and rise in the cases, as of now it's reported 141 million cases causing 3 million deaths worldwide. Several healthcare associations, croakers and scientists try to develop proper medicines and vaccines for this deadly contagion, but to date, no success is reported. This situation forces the worldwide community to feel for alternate ways to help the spread of this contagious contagion. Social distancing is claimed because the swish spread breach within the present script and everyone affected countries are locked down to apply social distancing. This disquisition is aimed to support and palliate the coronavirus epidemic along with side minimum loss of profitable endeavours, and propose an answer to descry the social distancing among people gathered at any public place. The word social distancing is swish practice within the direction of sweats through a spread of means, getting to minimize or intrude the transmission of COVID-19.

A. Objective:

As we all know that during COVID-19 situation the mandatory safety measures to be followed is face mask and social distancing . So to solve the issue,we have to create awareness among people and one much followed the steps and instructions from government and also our project helps. It identifiy whether the people are wearing mask or follwoing social distance.We can implement this project in too much rushy areas and even in traffic also.

B.Poject Scope:

Social distancing and face mask detection can identifies the people who are not wearing the mask and not maintaning the social distance.it can help the police to know that who are not taking the safety measures.

LITERATURE REVIEW

Estimated a virtual social distancing model that helps out the peoples being advised in the public places. They graphically represented four types of distance calling intimate space, particular space, social space and public distance. Grounded on distance dimension rule, the spaces are measured. The procedurebelongs to scene understanding and geometrical dimension, homograph estimation, metric references and viscosityestimation etc. the secondary analysis consists of two dimensional people discovery and multiple angle people discovery.

LITERATURE SURVEY

In the Literature check, (4) Presented a accretive composition that contains the different orders of COVID datasets available. These datasets are intimately available open source data. The listed sequence of data holds theX-rays images, CT checkup images, in many cases with health background is narrowed also MRI images are also used. Another set of dataset used for COVID analysis is textual data grounded on conversations, medical suggestions made on social media etc. Clinical test results and reports are also considered in numerous dataset windows that are employed for analysis of individual procedures. (1) Estimated a virtual social distancing model that helps out the peoples being advised in the public places. They graphically represented four types of distance calling intimate space, particular space, social space and public distance. Grounded on distance dimension rule, the spaces aremeasured. The procedure belongs to scene understanding and geometrical dimension, homograph estimation, metric references and viscosity estimationetc. the secondary analysis consists of two dimensional people discovery and multiple angle people Social Distance Monitoring and Face Mask Detection Using Deep Neural Network discovery. (3) Developed a new face recognition system using principle element analysis (PCA) and convolutional neural network. The trial is tested with discriminant algorithms,multi-layered perceptron, naïve bayes model and support vector machines. This journal on face recognition provides the challenges in feting the multi face model and how to overcome the same in unborn exploration (2) Estimated a deep literacy approach on face discovery and face bracket. Clustering of different faces are done usingpre-trained facial dataset. FDDB dataset is applied to train and test the proposed model. The proposed model is altered to gain novelty and high performing in vaticination. The delicacy achieved on using complication neural network is noted high and the unborn challenges are declared using real time face images and live capturing of vids.

MODULE DESCRIPTION:

A. Module description:

The machine makes use of a switch gaining knowledge of system to overall performance optimization with a deep gaining knowledge of set of rules and a pc imaginative and visionary to routinely reveal humans in public places with a digital digicam included with a raspberry pi4 and to discover humans with masks or no masks. We have used the MobileNetV2 structure due to the fact the center interpretation for discovery, as MobileNetV2 gives a large figure benefit as compared to the ordinary 2D CNN interpretation. We are loading the Mobile Net V2 with pre-processed ImageNet weights, leaving the community head out and erecting a totem new FC head, attaching it to the bottom as adverse to the antique head, and indurating the bottom layers of the community.

Real- time character discovery is fulfilled with the help of Single Shot item Discovery (SSD). A bounding box may be displayed round all face with mask detected. We after that calculate distance among all of the humans detected in video. However, a pink bounding field is proven round them, indicating that they now no longer keep a social distance

., If the gap among humans is much lower than 2measures.We used custom face crop datasets of more or less 1400 snaps annotated in masks and no masks created with the aid of using prajnabhandari. The end result of the SSD interpretation extracts someone masks and presents a bounding field. The machine video displays units' public locales constantly and whilst someone without a mask is detected his or her face is captured and an alert is dispatched to the government with face snap and on the equal time the gap among people is measured in effective time.

Examining our interpretation to part appliances for automated dogging of public places ought to lessen the weight of physical pursuit, that is why we pick to apply this structure. For calculating the social distance the maximum critical element turned into to calculate the gap among human beings. For calculating the gap we used the the module YOLOv3.This module has a set of rules generates bounding boxes because the anticipated discovery labors. Every awaited field is related to a character belief score. In the primary stage, all of the boxes underneath the character belief threshold parameter are neglected for in addition processing. We set every of them to 416, in order that we will examine our runs to the Darknet's C law given with the aid of using YOLOv3's authors. You also can extrade each of them to 320 to get quicker belongings or to 608 to get extra correct issues

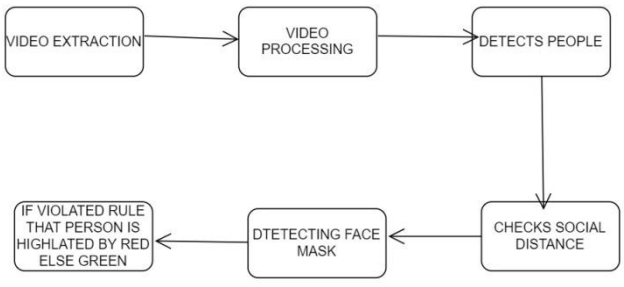

Fig.01 Face Detection by using video processing

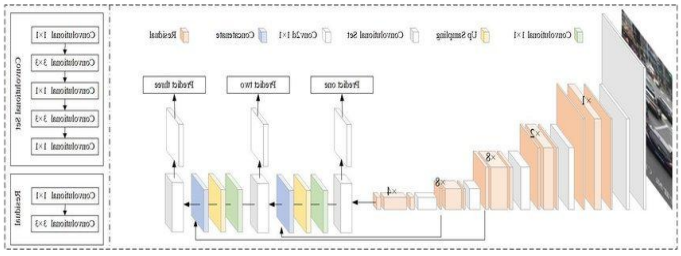

Fig.02 Convolution set

B. Architecture:

Architecture The Yolo algorithm stands for You Only Look onetime, this algorithm is a state of art, which works on a real- time system, assemble on deep knowledge for working varied Object spotting as well as Object YOLO Tracking problems. The configuration of Yolo can be observed from

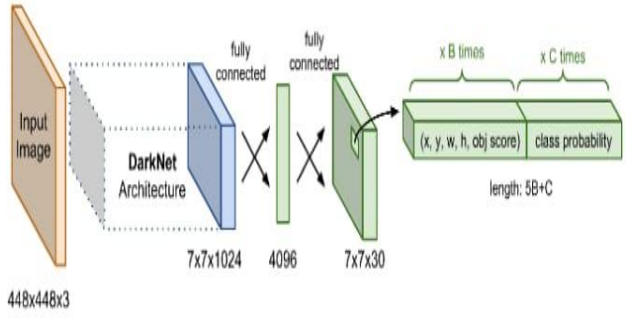

Fig.03 Yolo architecture

It can be observed from the below figure that the configuration contains the Input image layers which are responsible for taking the inputs that would be passed to forward layers, input can begiven based on the use cases, Along the input layer network for which architecture is created with the help of C &object chasing.

Further, the configuration consists of the flattened bracket which is densely connected with the convolutional bracket which is also densely connected to pass the data from each nodule to other nodules in the configuration, alike, this is passed to the affair bracket which gives 4- part values, those 4 region describe the forecast value for the bounding box, denoted by x, y, w, h, along with the object discovery score plus the probability of the forecast class. This YOLO is part of the One- Shot object sensor family which is accurate & fast, there's also a Two- Shot object sensor.

Two- Shot object sensors which are popular are R-CNN, Fast R-CNN, and Faster R-CNN, these algorithms are accurate in acquiring the results predicated on certain use cases but are slow as compared to that of Yolo, You Only Look Formerly is an algorithm that looks at the image at a single regard and predicated on that look predicts the bounding boxes related to certain classes, classes can be anything ranging from canine to Auto, or Gun to Tanks, this special point makes Yolo stand out from others. Different types of object sensors grounded on a shot can be observed in Fig 4 below.

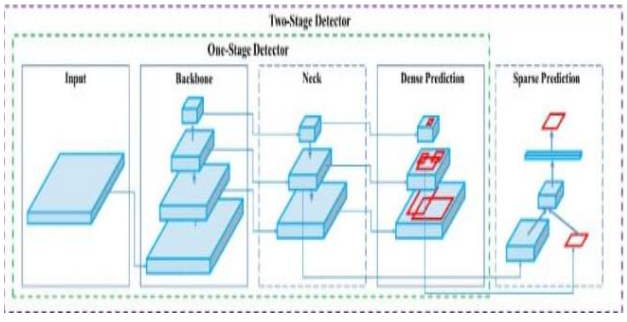

Fig.04. Different Types of Detector- Image

From the below figure, we can find out different factors, there are 4 different types of factors

.1. Input The input to the sensor can be an image or videotape predicated on the use cases specified in the exploration.

2. Backbone The backbone of the object sensor contains models, these models can be ResNet, DenseNet, VGG.

3. Neck The neck in the sensor acts as an excess bracket, which goes in correspondent to the backbone & the head.
4. Head The head is the network that's in charge of the discovery of objects grounded on bounding boxes.

RESULT AND DISCUSSION

The appliance is a deep getting to know answer that makes use of OpenCV and TensorFlow, to educate the interpretation. We integrate the deep getting to know YOLOv3 module with the SSD architecture for a quick and green deep getting to know answer for concrete- time human spotting in videotape aqueducts and use a triangular similarity approach to degree distance among individualities detected by means of digital digicam in concrete time in public places and accommodates custom designed information series to remedy a face masks finding interpretation with friction with inside the kinds of face mask worn by means of the general public in concrete time by a switch of getting to know to a pre-skilled SSD face sensor. This interpretation integrate's social distance discovery and face masks discovery

In the proposed appliance, 3 ways are followed, similar as

.1. Model enhancement and training
2. Model testing
3. Model accomplishment

A. Model enhancement and training-Our frame uses the transfer gaining knowledge of system and will acceptably- track the MobileNetV2 model, that may be a enormously inexperienced shape that can be done to hand bias with constrained computing power, at the side of jeer pi4 to encounter people in real time. We used 80 of our popular custom statistics set to train our model with a single shot sensor, which takes handiest one shot to encounter a couple of bias that are determined in an picture graph the operation of multi box. The custom statistics set is loaded into the challenge list and the set of regulations is knowledgeable at the conception of the labeled images. In pre-processing way, the picture graph is resized to 224 × 224 pixels, converted to numpy array format and the corresponding markers are added to the images with inside the dataset in advance than the operation of our SSD model as input to assemble our custom model with MobileNetV2 due to the fact the backbone and train our model the operation of the TensorFlow Object Discovery API. We also use the YOLOv3 model for calculating the distance amongst humans. It creates a frame and bias and the operation of ok system it finds the distance between two.

B. Model testing-The contrivance operates in an automated way and permits to automatically perform the social distance examination process. Once the model is knowledgeable with the custom data set and the pre knowledgeable weights given, we check the delicacy of the model on the test dataset with the useful resource of the operation of showing the bounding box with the decision of the label and the tone notion score at the top of the box. The proposed model first detects all elders with inside the style of cameras and indicates a green bounding box globular clearly anybody whos a prolonged manner from each exceptional after that model conducts a test on the identification of social distances maintained in a public place, if elders violating social distance morals bounding box shadeation changes to red for those elders and contemporaneously face mask discovery is finished with the useful resource of the operation of showing bounding boxes on the linked elders face with mask or non-mask labeled and also character notion scores. However, and if the social distance isn't saved, the contrivance generates a warning and sends an alert to watching authorities with a face image, If the mask isn't visible with inside the faces. The appliance detects the social distancing and face masks with a perfection of 91.7

C. Model accomplishment-The machine makes use of raspberry pi4 with a digital digicam to routinely music public areas in real- time to save you the unfold of Covid-19. The accomplished interpretation with the custom data set is set up with inside the raspberry pi4, and the digital digicam is hooked up to it. The digital digicam feeds real- time move screen of public places to the interpretation with inside the raspberry pi4, which constantly and routinely video display units public places and detects whether or not humans save secure social distances and again checks whether or not or now no longer or now now no longer those human beings placed on masks. When the discovery of a social distance violation thru humans is detected continuously in threshold time, there's assumably an pink alert that instructs human beings to maintain social distance.

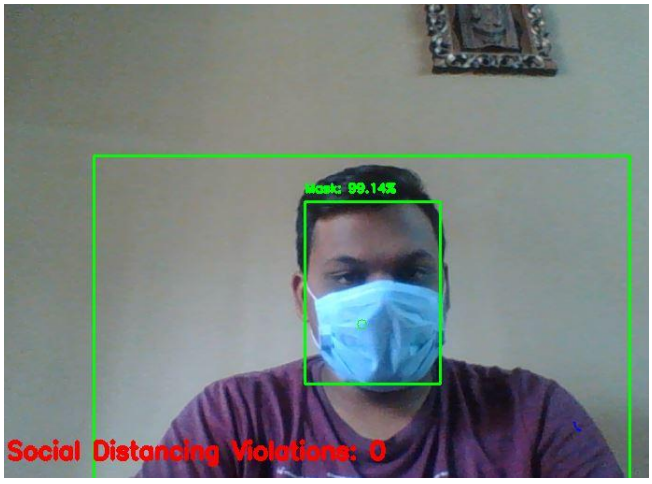

Fig.5 With mask.

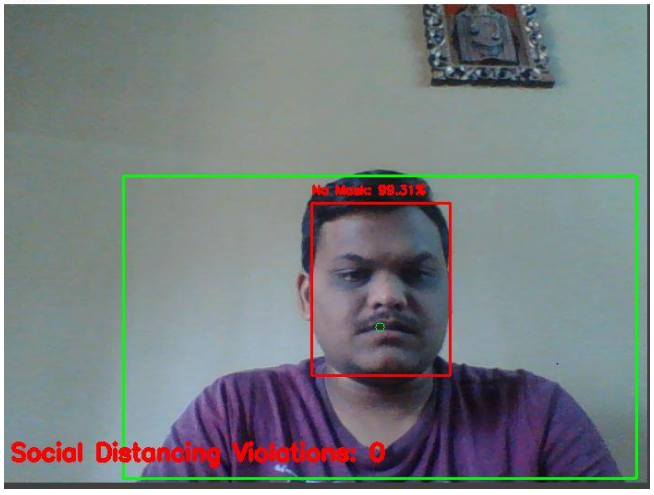

FIG.NO:6 Without mask

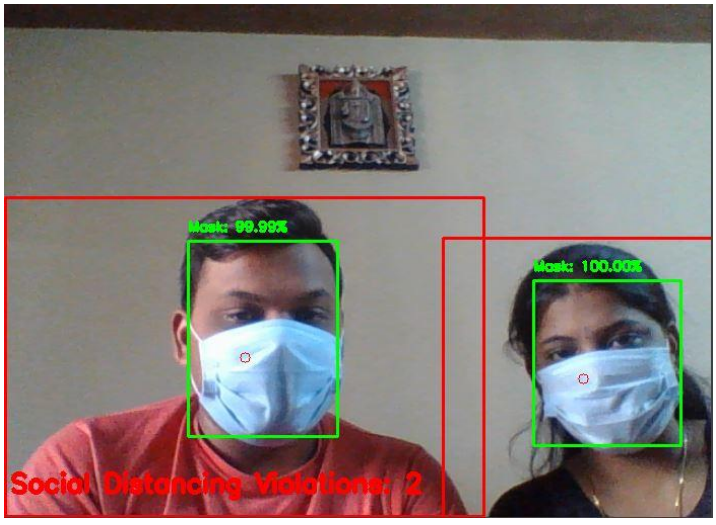

Fig.7 Result of Social Distancing

CONCLUSION

In this paper, we construct a interpretation which could stumble on concrete time face mask and again help in tracking the social distancing on this

epidemic script. As noted above we have used multiple libraries and tried multiple algorithms. Modules like YOLOv3 and tensor flow had been a number of the maximum vital libraries of our interpretation. It'll help hold a stable surroundings and make certain people safety by means of robotically tracking public locales to keep down from the unfold of the COVID-19 contagion through digital digicam feeds with raspberry pi4 in concrete- time. Therefore, this contrivance will serve in an green way with inside the ultramodern script whilst the walkout is eased and facilitates to tune public places without difficulty in an automatic way. We've addressed ferocious the monitoring of social distancing and the identity of face mask that help to make certain human health. The answer has the capacity to noticeably lessen violations by means of concrete- time interventions, so the proposed appliance could enhance public protection via saving time and backing to lessen the unfold of coronavirus. This answer may be applied in places like academes, boards, tabernacles, shopping complexes, metro stations, airfields, etc.

REFERENCES

[1]M.Cristani, A. D. Bue, V. Murino, F.Setti and A. Vinciarelli, "The Visual Social Distancing Problem," in IEEE Access, vol. 8, pp. 126876-126886, 2020, doi: 10.1109/ACCESS.2020.3008370.

[2]S. Sharma, M. Bhatt and P. Sharma, "Face Recognition System Using Machine Learning Algorithm," 2020 5th International Conference on Communication and Electronics Systems (ICCES), COIMBATORE, India, 2020, pp. 1162-1168, doi: 10.1109/ICCES48766.2020.9137850.

[3]D.Garg, P.Goel, S. Pandya, A. Ganatra and K. Kotecha, "A Deep Learning Approach for Face Detection using YOLO," 2018 IEEE Punecon, Pune, India, 2018, pp. 1-4, doi: 10.1109/PUNECON.2018.8745376.
[4]Sohan, M.F. (2020). So You Need Datasets for Your COVID-19 Detection Research Using Machine Learning ArXiv, abs/2008.05906

[5] P. Viola and M. Jones, “Rapid object detection using a boosted cascade of simple features,” in Proceedings of the 2001 IEEE computer society conference on computer vision and pattern recognition. CVPR 2001, vol.1. IEEE, 2001, pp. I–I.[1]

[6] M. S. Ejaz, M. R. Islam, M. Sifatullah and A. Sarker, "Implementation of Principal Component Analysis on Masked and Non-masked Face Recognition," 2019 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT), 2019, pp. 1-5, doi: 10.1109/ICASERT.2019.8934543.[2]

[7] R. Girshick, J. Donahue, T. Darrell, and J. Malik, “Rich feature hierarchies for accurate object detection and semantic segmentation,” in Proceedings of the IEEE conference on computer vision and pattern recognition,2014, pp. 580–587.[3]

[8] J. Redmon, S. Divvala, R. Girshick, and A. Farhadi, “You only look once: Unified, real-time object detection,” in Proceedings of the IEEE conference on computer vision and pattern recognition, 2016, pp. 779–788.[6]

[9] R. Girshick, “Fast r-cnn,” in Proceedings of the IEEE international conference on computer vision, 2015,pp. 1440–1448.[7]

[10] M. E. Rusli, S. Yussof, M. Ali and A. A. Abobakr Hassan, "MySD: A Smart Social Distancing Monitoring System," 2020 8th International Conference on Information Technology and Multimedia (ICIMU), 2020, pp. 399-403, doi: 10.1109/ICIMU49871.2020.9243569[8]