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# PREDICTION OF COVID FACE MASK DETECTION USING OPEN CV

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**Abstract -** *In this proposed system, Raspberry pi used for Face mask detection by using the Pi Camera. The Raspberry pi is the heart of the proposed system which has been employed to detect those who are not wear the mask. The Buzzer is used for Intimation and Alarm Signal for Nearby Place who are Present there at that Location without mask. The Camera Module has been interfaced along the Raspberry pi in order to capture the video of people not wearing the mask and email it to the user with the Captured Face Image.*

***Key Words***: Covid-19, Open CV, Camera, Raspberry pi, Face Recognition.

## 1. INTRODUCTION

Discretion is the better part of velour; is the effective measures to prevent the spreading of COVID-19 and to protect mankind. Many researchers and doctors are working on medication and vaccination for corona. COVID-19 spreads mostly by droplet infection when people cough or if we touch someone who is ill then to our face (i.e. rubbing eyes or nose). Ongoing spreading, we've two cases: Fast and Slow spread. Fast pandemic is going to be terrible and can also cost many lives. It occurs thanks to a rapid rate of infection because there are not any countermeasures to slow it down. This is often because, if the numbers of infected people get overlarge, healthcare systems become unable to handle the situation. We'll lack resources like medical staff or equipment sort of a ventilator. To avoid the above situation, we'd like to try to to what we will to show this into a slow pandemic. An epidemic is often bogged down only by the proper responses, mainly within the early phase. During this phase, everyone who is sick can get treatment and there's no emergency point with the flooded in hospitals. During this pandemic, we'd like to engineer our behavior as a vaccine. That is, & quot; Not getting infected & quot; and & quot; Not infecting others & quot; the simplest thing we will do is to scrub our hands with soap or a hand sanitizer. Subsequent neatest thing is social distancing. To avoid getting infected or spreading it, It is essential to wear a face mask while going out from home especially to public places such as markets or hospitals. In this project design mask wearing person only allow in the certain place. If someone is not wear the mask they do not permit at the same time it will send the mail. The buzzer places the major role for alerting the people and message will display in the LCD.

### 1.1 PROJECT SCOPE

This plan can be utilized in schools, hospitals, banks, airports, and etc. as a compute examining device. The process of determining people's faces and isolating them into two types namely the people with masks and people without masks is done with the assist of image processing and deep learning. Manual Monitoring is very difficult for officers to check whether the peoples are wearing mask or not. So in our technique, we are using web cam to detect people's faces and to prevent from virus transmission. It has fast and high accuracy. This system can be implemented in ATMs, Banks etc. We can keep peoples safe from our technique. It provides buzzer sound to wear mask.

## 2. LITERATURE SURVEY

[1] Truong Quang Vinh, Nguyen Tran Ngoc Anh. "Real-Time face mask detector Using YOLOv3 Algorithm and Haar Cascade Classifier", 2020.During the pandemic of Covid-19, wearing face mask in some factories, departments, or working offices is required. This idea portrays a real-time face mask detector which can alarm when detecting a person without wearing a face mask. Moreover, the system can recognize the person who have on a face mask incorrectly, or wear other things except a face mask. The proposed algorithm for face mask detection in this system utilizes Haar cascade classifier to detect the face and YOLOv3 algorithm to detect the mask. The complete procedure has been built and demonstrated in a practical application for checking people wearing face mask at the office entrance. The experiment result shows that the accuracy of the system can achieve up to 90.1% system utilizes Haar cascade classifier to examine the face and YOLOv3 algorithm to detect the mask.

[2] Wei Bu, Jiangjian Xiao, Chuanhong Zhou. "A cascade structure for face masked system", 2020. Exactly and ability examining masked faces is expanding relevant, after all it can be put in on tracking and discovering culprits or gun mans. As a different profile detection function, masked face

examination is much heavier due to severe barrier which heads to the dropping of face characteristics. Other than, there is nearly no subsisting extensive precisely categorized masked face data file, which enlarges the hardness of masked face detection. The Convolutional Neural Network-based deep learning designs has made great breakthroughs in many computer vision areas including face detection. In this paper, we propose a new CNN-based cascade structure, which contains of three attentively planned convolutional neural networks to examine masked faces. Besides, because of the shortage of masked face training samples, we advanced a current dataset called & quot; MASKED FACE dataset & quot; to fine-tune our CNN models. We evaluate our proposed masked face detection algorithm on the MASKED FACE testing set, and it achieves satisfactory performance.

[3]Gabriel T.S. Draughon, Peng Sun. connecting numerous greenways, plazas, pavilions, and open green spaces along the Detroit River in Detroit application of a Computer Vision structure for Tracking and Visualizing Mask Usage in Urban Environments", 2020. Michigan. The detection of park client genre is shown to possess a mean precision of 89% and better for many person classes with the mask detector having an accuracy of 96%. An interactive web the covid-19 virus widespread is a developing situation within the us and is open out at agitating rates. The borrowing of society health-informed hygienic implementation that can have an outsized impact on group imparting of covid-19 consists of the wearing of the profile masks publicly settings. The convolutional neural networks (cnn) are often trained to divide people wearing profile masks with imposing exactly. Although, current mask datasets contain clear, high-

Resolution close-up images of people with face masks which is odd of the bottom correctness images of far way faces more important in city camera images. This idea put forwards an experimental deep learning computer vision structure for the detection and tracking of the individuals publicly spaces and therefore the usage of the face masks. A custom 6,000 image mask data file curated from over 50 hours of urban surveillance camera footage is made during this work. Cnn- based detectors trained using the data file are not enough to perform the person detection and mask classification. Then, a multi-target tracking module extracts individual trajectories from frame-51 by-frame 5 detection. By associating detected face masks with the tracked individuals, the overall mask usage is often estimated. The framework is implemented on several of the surveillance cameras along the Detroit River walk, a 5-kilometer pedestrian ark visualizes the information and it is employed by the park managers and to tell management decisions and assess the strategies that want to increase mask usage rates.

## 3. OBJECTIVE

Face mask detection involves in detecting the position of the face and then determining whether it has a mask on it or not. The situation is imminent comparable to common device to detect the classes of objects. Face identification categorically deals with distinguishing a specific group of entities i.e. face. It has numerous applications, such as autonomous driving, education, surveillance, and so on [5]. This idea of existing a clarified approach to serve the above purpose using the essential Machine Learning (ML) packages like Tensor Flow, Keras, OpenCV and Scikit-Learn. However, it's infeasible to instructions to impose such a plan on large premises and find any of the violations. The Computer Vision provides a far better alternative to the current method, employing a combination of image classification, object detection, object tracking, and video analysis, we developed a powerful structure which will examine the presence and absence of profile masks in images also as videos. during this paper, we propose a two-stage CNN architecture, where the primary stage detects human faces, while the second stage uses a light-weight image classifier to classify the faces detected within the first stage as either 'Mask' or 'No Mask' faces and draws bounding boxes around them alongside the detected class name. This algorithm was further extended to videos also. The detected profiles are then tracked between setting using a device finding designs, which makes the examinations powerful to the noise thanks to motion blur. this technique can then be integrated with a picture or video capturing device sort of a CCTV camera, to trace safety violations, promote the utilization of face masks, and ensure a secure working environment.

## 4. PROPOSED SYSTEM

Coronavirus disease 2019 has been widespread worldwide since December 2019. It is highly contagious, and severe cases can head to drastic breathing distress or multiple organ failure. In this advanced system, Raspberry pi used for Face mask detection by using the Pi Camera. The Raspberry pi is the heart of the proposed system which has been employed to detect those who are not wear the mask The Buzzer is used for Intimation and Alarm Signal for Nearby Place who are Present there at that Location without mask. The Camera Module has been interfaced along with the Raspberry pi in order to capture the video of people not wearing the mask and email it to the user with the Captured Face Image.

### 4.1 HARDWARE USED

#### 4.1.1 RASPBERRY PI

The Raspberry pi may be a single computer board with master card size, which will be only used for the several tasks that your computer does, like games, data processing, spreadsheets and also to play HD video. it had been established by the Raspberry pi basement from the United Kingdom. it's been ready for public consumption since 2012 with the thought of creating a low-cost

educational microcomputer for college kids and youngsters. The most purpose of calculating the raspberry pi panel is, to encourage study, demonstration and the innovation for college level students. The raspberry pi board may be a portable and low cost. Maximum of the raspberry pi computers is employed in the mobile phones. within the 21st century, the expansion of the mobile computing technologies is more extremely/greatly high, an enormous segment of this being driven by the mobile industries. The 98% of the cellular telephones were using machinery. The raspberry pi comes/has in two models, they are known as model A and model B. The most difference in the middle of model A and model B is USB port. The Model board will consume less/low power which doesn't include an Ethernet port. But, the model B board includes an Ethernet port and designed in china the raspberry pi approaches with a group of open source technologies, i.e. communication and multimedia webbing technologies. Within only the year 2014, the inspiration of the raspberry pi board launched the pc module that packages a model B raspberry pi board into module to be used as a neighborhood of the embedded systems, to encourage their use. The raspberry pi model aboard is meant with 256MB of SDRAM and model B is meant with 51MB.Raspberry pi may be a small size PC compare with other PCs. the traditional PCs RAM memory is out there in gigabytes. But in raspberry pi board, the RAM memory is out there quite 256MB or 512MB.

**Fig -1**: Raspberry pi

### 4.1.2 PI CAMERA

The Pi's camera element is fundamentally a mobile phone camera element. Mobile phone electronic cameras varies from immense, much extravagant, cameras (DSLRs) in some regards. The major influentially of these, for deciding the Pi's camera, is that many mobile cameras (including the Pi's camera device) use a rolling shutter to capture images. When the camera requires to encapsulate an image, it skim out pixels from the sensor a row at a slot rather than capturing all pixel rate at once.

**Fig - 2:** Pi camera

### 4.1.3 HDMI (High-Definition Multimedia Interface):

Here the High-Definition Multimedia Interface (HDMI), the primary industry-supported uncompressed, all-digital audio/video interface. It's one cable and environmentally-friendly junction that restored the maze of mending behind the house entertainment center. HDMI prepares a linkage in the middle of any audio/video source, like a set-top box, Digital Versatile Disk (DVD) player, or A/V receiver and an audio and/or video monitor, like a digital television (DTV), over one cable. HDMI assists graded, increased, or high prescribed video, plus multi-channel binary audio on one cable. It conveys all Advanced Television Systems Committee (ATSC) HDTV grades and encourages 8-channel digital audio with bandwidth to additionally to composed of upcoming strengths and demands. HDMI was defined to hold 8 channels, of 192 kHz, 24-bit relaxed audio, which outreaches the current consumer of media formats. Additionally, HDMI can shift any indication of flattened audio format like Dolby or DTS. HDMI has the potential to assist advanced high definition video/image stream formats such as 720p, 1080i, and 1080p, alongside support of the upgraded prescribed patterns similar to 480p, also such as a standard definition formats like NTSC or PAL HDMI interfaces uses the transition-minimized differential signaling (TMDS) lines to hold video, audio, and data within the sort of packets. Additionally, to those multimedia waves, the network consists Display Data Channel (DDC) waves for swapping Extended Display Identification Data (EDID) and for High-bandwidth Digital Content Protection (HDCP). Additionally, the HDMI interfaces are more often equipped with Audio Return Channel (ARC), Consumer Electronics Control (CEC) and Residential Ethernet Channel (REC). Since these are as not much as essential to the appliances or devices that are described this above in this above given information.

**Fig -3**: HDMI (High-Definition Multimedia Interface)

## 5. EXPERIMENTAL RESULT

The results of the proposed model can be analyzed

1. Initially the person is detected with a camera for the wearing of mask, as the faces has to be trained as follows,

**Fig -4:** Trained faces

2.If person wears a face mask, then output is updated as person weard a profile mask or else it follows with the updated of person not wearing a mask.

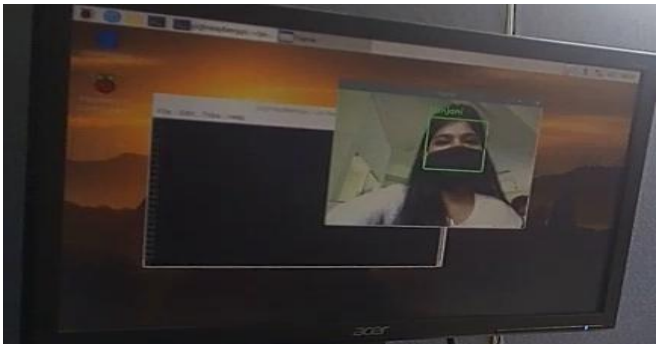
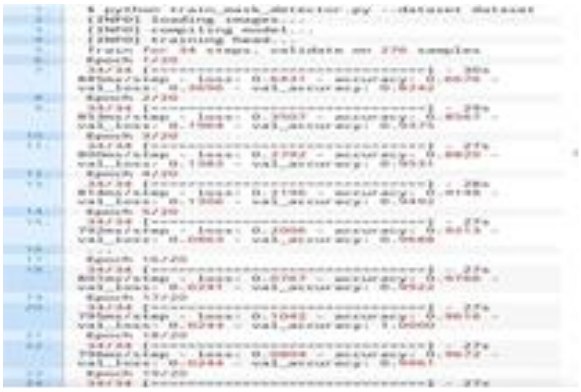


**Fig -5:** A person wearing mask

**Fig -6:** Output Setup

3. The data that have been stored in a sheet as it keeps updating the information as the person wears a mask or not.



(a)

```
793ms/step - loss: 0.0836 - accuracy: 0.9710 -
val_loss: 0.0440 - val_accuracy: 0.9883
Epoch 20/20
34/34 [==============================] - 28s
838ms/step - loss: 0.0717 - accuracy: 0.9710 -
val_loss: 0.0270 - val_accuracy: 0.9922
[INFO] evaluating network...
              precision    recall  f1-score
support

   with_mask       0.99      1.00      0.99
138
without_mask       1.00      0.99      0.99
138

    accuracy                           0.99
276
   macro avg       0.99      0.99      0.99
276
weighted avg       0.99      0.99      0.99
276
```

(b)

**Fig -7:** a, b Data stored

## 6. CONCLUSION

This project is economical and can be positioned in communal areas such as hospitals and markets to reduce the expanding of the virus accidently. The complete world is proceeding through a broad of conflict and agony due to COVID-19. Let's stay efficient at home and encourage our kind to battle in opposition to this rampant by wearing the mask in public place. This project is really helpful to predict the people those who are not wear the mask by alerting the people through the email it is the easy method to identify the people during this pandemic situation. We can design a camera which will sense both human temperature and human mask wearing status instead of using two different cameras (thermal camera and mask wearing identifying camera) separately. We can also design a feature where an email-warning will be sent if the mask is not worn.

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