

## Smart Face Mask Detection Using MI

1. <sup>1</sup>Kiruthika S, <sup>2</sup>Niranjana S R, <sup>3</sup>Subiksha M, <sup>4</sup>Vaishnavi S

<sup>1</sup>Assistant Professor, Department of Computer Science & Engineering., K.Ramakrishnan college of Technology, Tamilnadu, India.

<sup>2</sup>Student, Department of Computer Science & Engineering., K.Ramakrishnan college of Technology, Tamilnadu, India.

<sup>3</sup>Student, Department of Computer Science & Engineering., K.Ramakrishnan college of Technology, Tamilnadu, India.

<sup>4</sup>Student, Department of Computer Science & Engineering., K.Ramakrishnan college of Technology, Tamilnadu, India.

### ABSTRACT

After the breakout of the worldwide pandemic COVID-19. There arises a severe need of protection mechanisms, face mask being the primary one. The main aim of the project is to detect whether the person is wearing mask on live streaming image as well as on the video. The basic concept we used is of transfer learning in neural networks and the final output is to detect the presence or absence of a face mask in a video that is streaming or in an image. Till now there is no sufficient application that helps to check for a person wearing face cover or not which is on high demand in many places like transportation means, densely populated areas like schools, malls, airports etc. to ensure safety. Therefore, this system will be sufficient to detect the face mask on human faces and would drive them to be safe and secure. This system can also be used in public places to make the people aware and for their safety purpose.

### INTRODUCTION

COVID-19 is the disorder caused by a brand new corona virus referred to as SARS-CoV-2. WHO first discovered of this new virus on 31 December 2019, following a record of a cluster of cases of 'viral pneumonia' in Wuhan, people's Republic of China. The most not unusual signs of COVID-19 are Fever, Dry cough, Fatigue. humans of every age who enjoy fever and/or cough associated with trouble respiration or shortness of breath, chest ache or pressure, or lack of speech or movement need to be searching for hospital treatment right now. amongst people who expand signs, maximum (about 80%) recover from the disease without needing health facility remedy. approximately 15% grow to be seriously ill and require oxygen and 5% emerge as critically unwell and want in depth care. headaches leading to loss of life can also consist of breathing failure, acute respiration distress syndrome (ARDS), sepsis and septic shock, thromboembolism, and/or multiorgan failure, which include harm of the heart, liver or kidneys. In rare situations, children can expand a severe inflammatory syndrome a few weeks after contamination. stay secure by way of taking a few easy precautions, which includes bodily distancing, wearing a mask, especially while distancing cannot be maintained, preserving rooms nicely ventilated, heading off crowds and near contact, often cleansing your palms, and coughing into a unethical elbow or tissue. Tragically, human beings don't consider those norms now-a-days. This task consciousness on how crucial is it for a person to put on face cover to live secure.

The number one position of face masks is to save you the transmission of SARS-CoV-2 through breathing droplets, that can without problems enter through the mouth and nose to contaminate new hosts. the person who wears face covers in such a manner that if either the face or nostril stays uncovered, remains prone to the ailment. The most important gain of sporting a face cowl is to save you others from the ailment if incase an individual got here in touch with an inflamed character in preference to appearing as a service of the disease. Strict legal guidelines to put on face veil by using the authorities act as a preventive measure. The government by myself cannot scale back the unfold of the pandemic with out the energetic support and participation of the human beings. so maintaining the humans's fitness in thoughts our group has come ahead to introduce this mission to guard the people shape this pandemic ailment. Our venture face mask detection makes a speciality of detecting the people without masks inside the densely populated areas, residential districts, big scale producers and other organizations to make sure protection. Face masks detection platform makes use of RCNN to recognize if the human beings don't wear mask. The CCTV digital camera captures the mass of the humans and this video is given as enter to the multilayer perceptron to transform into pictures. Then these images are categorized into 3 corporations consisting of masked, semi masked and no masks agencies. After identifying the semi masked and no masked group the intimation regarding this will be despatched as a notification to the authority in addition to to the people to insist them to wear mask. This task facilitates the humans in airports railway station, offices, schools and in crucial public locations.

## LITRATURE SURVEY

Md. RafiuzzamanBhuiyan et., al proposed a device wherein gave an output whose common frames consistent with 2d is 17. but since the resources is confined higher frames in keeping with 2nd price in films could not be finished.[1]. comparable structures proposed by using RudrakshKapil et., al whose overall performance had been tremendous even wherein the public areas captured had been crowded however was now not capable of perceive subjects who have been incorrectly wearing a facial masks (i.e. the mask turned into not overlaying their mouth and nostril) and classified them as 'No masks'.[2]. Implementation of a pc vision Framework for monitoring and Visualizing Face masks usage in city Environments wherein CNN become used to perform person detection and face masks detection with excessive accuracy. however the framework can't song as human beings move from one as they move between one of a kind fields[3]. The gadget Face masks detection the usage of MobileNet and worldwide Pooling Block proposed model takes much less time for training and checking out as compared to present fashions. But the paintings cannot cognizance on face mask detection over multi-face pix[4]. The system by means of Mustapha Hamdi et., at were given an superb overall performance (ninety seven.eleven%) but can't detect from stay video[5]. A machine by means of Wei He et., al presents answer even for the examine of multi-angle troubles whose accuracy is handiest 60.9% [6]. A device by using Rama Moorthy et., al will seize live video from its premises and faces might be detected in the video. The operation of camera and face detection is a very automatic method and no human intervention is needed [7]. it's miles constrained in this type of manner that the dataset is minimum it may't be hired for larger obligations[7]. The approach works for facial photos with diverse resolution (from high to low first-rate) and also for various facial poses (from frontal to tilted or rotated).[8]. A mask Detection technique for

shoppers below the chance of COVID-19 Coronavirus is lightweight spine network and feature Enhancement Module (FEM), which improves the general detection effect of the set of rules. It can't identify mistaken carrying of mask [9]. An automated gadget to restriction COVID-19 using Facial mask Detection in clever metropolis network detects a facemask with an accuracy of 98.7%. The selection of the type network is transferred to the corresponding authority. It is confined in this kind of way that whilst any character without a face masks is travelling on any automobile, the machine cannot locate that character efficiently[10].The analysis shows that the classification and detection of oral cancer is made easier using vey deep convolutional neural network and improved the detection accuracy rate of 98.14% [13].

## METHODOLOGY

The proposed system focuses mainly on finding individuals in a public place who are not covering their face with a face veil. CCTV cameras observe the open spots in the city. The pictures from public places are caught by the camera at that point these pictures are inputted into a frame work that distinguishes assuming any individual without veil shows up in the picture. On the off the chance that any individual without a face cover is recognized then this data is shipped off the legitimate position to make fundamental moves. All the squares of the created framework are portrayed as follows.

### A. Picture pre-processing

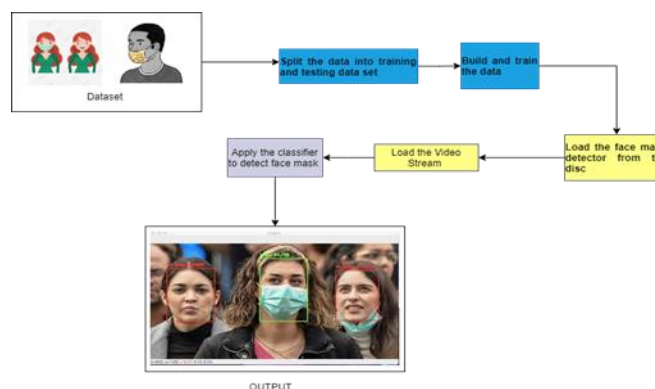
The pictures caught by the Surveillance camera footages required pre-processing prior to go into the subsequent stage. In the previous step the image is converted into a grayscale image in the light of the fact that the RGB shading picture contains to such an extent excess data that isn't required for face cover recognition.RGB shading picture put away 24 bits for every pixel of the picture. Then again, the grayscale picture put away 8 cycle for every pixel of the picture and it contained adequate data for order. At that point, we reshaped the pictures into (64x64) shape to keep up consistency of the information pictures to the design. At this point the pictures are standardized to the pixel level 0-1.

### B. Profound learning architecture:

The profound learning design learns different significant nonlinear highlights and this learned design is utilized to foresee the beforehand concealed examples. We gathered picture from various sources to train our profound learning design. The learning strategy exceptionally relies upon CNN. Every one of the parts of profound learning engineering are portrayed underneath.

#### 1)Dataset collection:

we gathered a sum of 858 pictures of individual with cover and 681 pictures of individuals without a cover[11].80% of pictures of each class are utilized for preparing purposes and the remaining pictures are used for testing purposes.



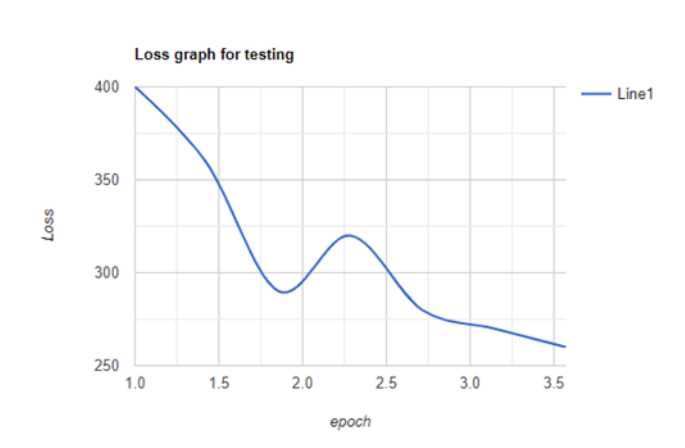
## 2)Architecture development:

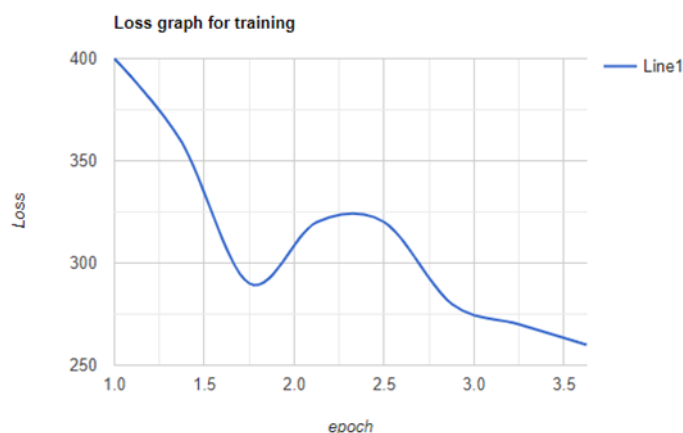
CNN is exceptionally valuable for design acknowledgement[13]. This organization involves an information layer a few secret layers and a yield layer. The secret layer consists of various convolution layers that learn appropriate channels for significant component extraction from the given examples Highlights separated by CNN are utilized by numerous neural networks for characterization purposes.

## RESULT ANALYSIS:

Since the dataset is limited, we are splitting the dataset into 2 halves for training and testing phase. Out of 3751 images 85% of which is used for training and the rest is used for testing. The training is limited to 94 epochs, since the dataset available is limited to a greater extent and training more than 94 epochs might cause overfitting.

The accuracy curve for training and testing is shown and is found to be more or less similar to each other. As the number of epochs increases the loss function starts given a minimal value as its output indicating the loss is lesser in amount.





## CONCLUSION

Thus, we would like to conclude that our system performs very well in detecting whether the person is covering his/her face with mask or not or covered his/her face partially using RCNN. The performance level of the system is quite interesting and we have come across good results as we have applied it in real-time. The extraction of images from video was good as the fps rate is quite high while using RCNN. We have applied this model to check the real-time experience and it gave us real insight about wearing mask. We have collected a lot of dataset to train our model and the added advantage is our model would detect even if the real-world data is flipped or rotated.

## FUTURE WORK

Though our project is quite enough but still betterment is always an open door. In this case we can add various data set to come across with accurate results and would like to increase the fps rate to obtain lit results. In future we would like to enhance our project into a better machine.

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