

Real Time Face Mask Detection

Diya Garg¹, Kanika Tyagi², Juhi Oberoi³, Akanksha Kirola⁴

Ms. Chhavi Sharma, Dept. of Inderprastha Engineering College, Ghaziabad, India

Abstract -CoronaVirus illness (COVID-19) pandemic is inflicting a health crisis. One among the effective strategies against the virus is carrying a mask. One of the best ways in which to remain safe from obtaining infected is carrying a mask in open territories as indicated by the globe Health Organization (WHO) during this project, we tend to propose a technique that employs TensorFlow and OpenCV to notice face masks on folks. This paper introduces mask detection that may be employed by the authorities to create mitigation, evaluation, prevention, and action designing against COVID-19. The mask recognition during this study is developed with a machine learning formula through the image classification method: MobileNetV2. The steps for building the model square measure collection the information, pre-processing, ripping the information, testing the model, and implementing the model. The engineered model will notice people that square measure carrying a mask and not carrying it at an accuracy of 96.85 percent.

Key Words: Artificial Intelligence (AI), Machine learning (ML), Deep neural learning (DL), Convolutional Neural Network Model (CNN), Artificial Neural Networks (ANN.)

INTRODUCTION

In the shadow of the COVID-19 pandemic, facemask carrying becomes obligatory in many public places throughout the planet, a useful resolution that has verified to be useful in safeguarding these places and reducing the unfold of this pandemic. Several rules square measure set to force carrying a facemask publically and workplaces, which represent hotspots for the unfold of this by not carrying a mask period of time infection. However, not each individual is aware or compliant, therefore risking his or her life and therefore the lives of others watching facemask wearing for an oversized cluster of individuals is becoming a troublesome task. Manual monitoring is normally arduous to enforce because of the men required to efficiently defend public areas and to ensure that people square measure carrying masks correctly except for the value issues and social control effort, the most important downside is the health issue as a result of an exact set of employees are going to be in grips with hundreds of folks daily, that poses a risk of them acting as inflection points, therefore we have a tendency to aim to eliminate the human factor contact after the increase of Covid-19, the Face-Mask detection has been wide considered a retardant within the image processing field. This technology is

currently a lot more acceptable as a result of it's applied to find faces and to spot people carrying masks in pictures, videos and additionally in period of time vision. By exploiting deep learning and convolution neural network (CNN) techniques, it becomes attainable to achieve high accuracy leads to image classification and object detection applications. making a system for detecting the face-mask can give some way to dominate those that enter any place. The projected system during this paper uses deep learning, TensorFlow, Keras, and OpenCV, that square measure used as a picture classifier to find face-masks.

Literature Review

Face Mask detection with fine rate Author : R Suganya , SARthi, S Kowshika, V Dhivya Lakshmi. Description : Deep learning technique has been useful for big data analysis and has its applications in computer vision, pattern and speech recognition, etc. A CNN model for speedy face detection has been introduced that evaluates low resolution an input image and discards non-face sections and accurately processes the regions that are at a greater resolution for precise detection. The Face Mask Detection Technology for Image Analysis in the Covid19 Surveillance System Author : G K Jakir Hussain, R Priya , S Rajarajeswari , P Prasanth , N Niyazuddeen. Description : A feasible approach has been proposed that consists of first detecting the face mask region and checking whether persons wear mask or not wear mask and after checking human body temperature using Pc and interrupt to Arduino controller then adding to hand sanitizer. RFID is used for calculating the attendance. Then mask the pc using CNN algorithm.

Proposed Approach

We decided to build a very simple and basic Convolutional Neural Network (CNN) model using TensorFlow with Keras library and OpenCV to detect if you are wearing a face mask to protect yourself. All the aspects of our work are described below :

A. Deep learning design The deep learning design learns varied necessary nonlinear options from the given sample. Then, this learned design is employed to predict antecedently unseen samples. Deep learning is assessed as a joint domain of machine learning. It's a field that takes data from the past and provides the required output through the analysis of advanced pc algorithmic rules.

B. Dataset assortment to coach our deep learning design, we tend to collect pictures. The design of the training technique depends on CNN. Information is collected for coaching and testing the model. Dataset contains pictures of faces solely. It consists of 2535 pictures during which 1220 pictures contain individuals with face masks and 1315 pictures containing individuals without face masks. For coaching functions, eightieth pictures of every category area unit were used and therefore the remainder of the pictures area unit used for testing functions. The projected system used face cropped information containing pictures with totally different |completely different angles and different poses of face with and while not masks that area unit labeled and is employed to coach our model. The \$64000 time automatic mask detection has been done by MobileNet and OpenCV. Faces with masks embrace a mask with hand, with masks and alternative objects that cowl the face, that gives the U.S. a bonus to boost variants of the dataset.

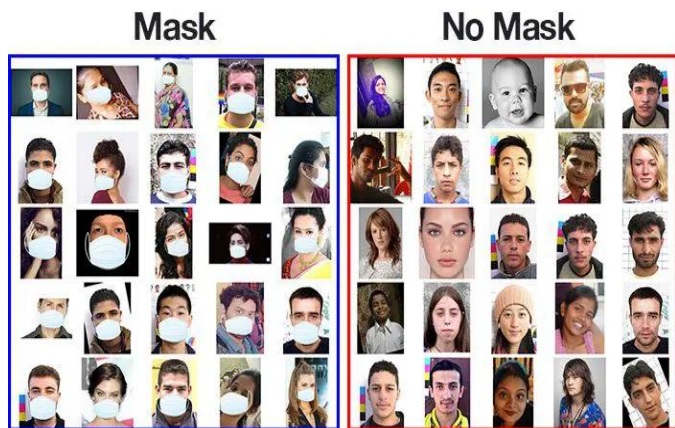
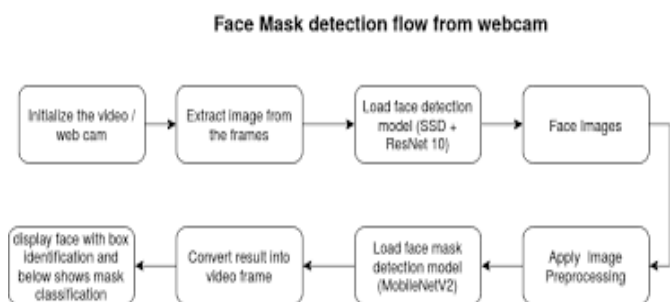


Fig-1 Dataset of mask and No mask

C.Architecture Development : The learning model is predicated on CNN which is incredibly helpful for pattern recognition from pictures. Neural Networks have to be compelled to see information from each of the categories. The network contains an associated input layer, many hidden layers and an output layer. The hidden layers consist of multiple convolution layers. The options extracted by CNN square measure are used by multiple dense neural networks for classification model functions.



D.Building and coaching the Model In the planned system the custom dataset is loaded and also the algorithmic program is being trained primarily based on labeled pictures. During this step the picture's square measure resized and it has been reborn into a numpy array. format. This model uses MobileNet play acting as a backbone and trains the model exploitation TensorFlow. We've shown Model coaching accuracy/loss curves. Parameters with a learning rate (initial) of INIT_LR = 1e-4, batch size bachelor's degree = 32 and also the range of epoch EPOCHS = twenty. For the model digital camera is employed for mask detection and once the person is found we tend to mark the person with the sq. finite box.

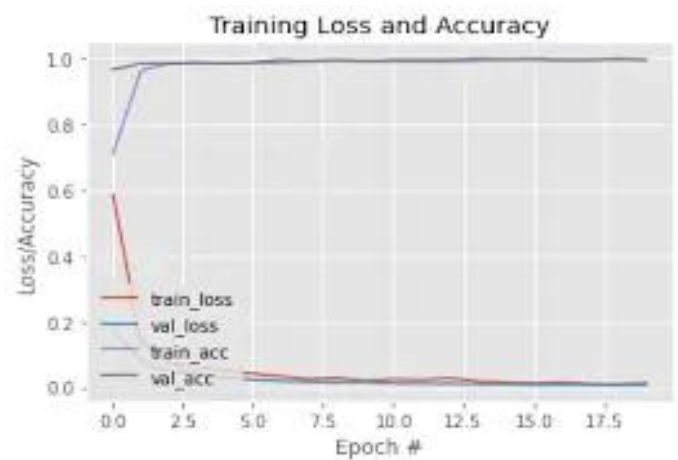


Fig -2: Showing Training loss and Accuracy



Fig -3: Detecting mask or No mask

CONCLUSIONS

In our analysis we've got a system that mechanically identifies whether or not or not a person is sporting a mask and gives notice to the higher authorities if not sporting a mask. This projected system uses pc Vision and MobileNet to assist the general public make sure that they are sporting face masks and to stay away from the unfolding of COVID-19 virus. Our analysis additionally helps police or higher authorities create it easier to spot

whether or not a person is sporting a mask, if not then they will also have the victim's pic so that they can take any actions. The projected system is often enforced in places like railway stations, shopping malls, offices, schools, airports, etc.

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