



Face Mask Detector

Group Members

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Introduction

- After the breakout of the worldwide pandemic COVID-19, there arises a severe need of protection mechanisms, face mask being the primary one.
- The basic aim of the project is to detect the presence of a face mask on human faces on live streaming video as well as on images.
- We have used deep learning to develop our face detector model.



Objective

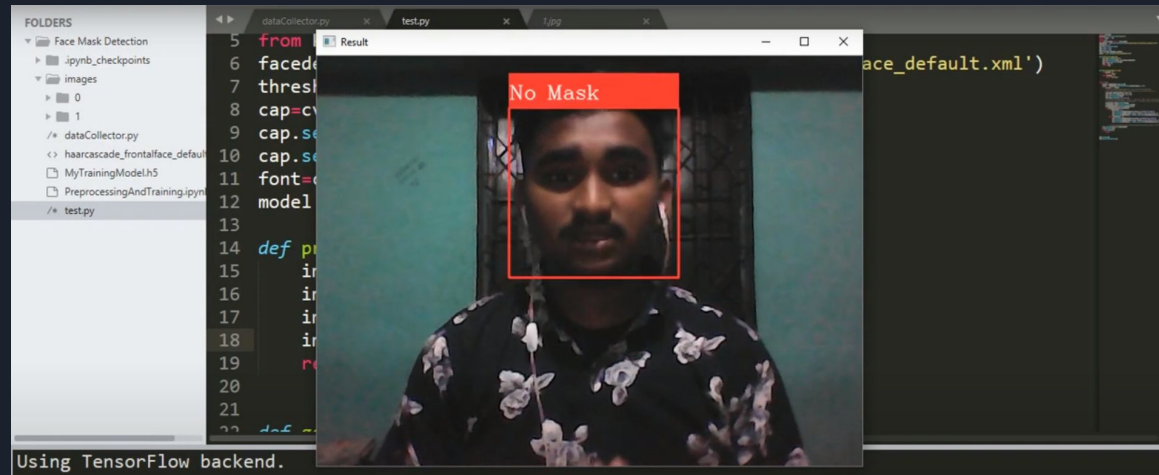
- To enforce the mandate for wearing masks in public places following the COVID-19 pandemic.
- To effectively provide a working model for accurate mask detection.
- To utilize image processing approaches to identify the presence of a mask on face.
- To develop an efficient computer vision based system focused on the real time automated monitoring of people to detect face mask in public places.

Literature Survey

Sr no.	Title	Date of Publishment	Authors
1.	Deep learning and control algorithms of direct perception for autonomous driving	2019	D.H.Lee,K.-L.CHEN,K.H Liou,C.Liu,and J.Liu
2.	Masked face recognition data sets and application National natural science foundation of china	2020	Guang cheng wang, yumiao
3.	Face Mask Detector	July 2020	Raza Ali, Saniya Adeel,Akhyar Ahmed
4.	Object detection with deep learning IEEE transactions on neural networks and learning systems	2019	Z.-Q. Zhao, P. Zheng, S.-t.Xu, and X. Wu

Existing System

- Face Mask detection System using OpenCV and Deep Learning(Reference:KNOWLEDGE DOCT OR youtube channel)





Drawbacks of the Existing System

- **Drawback 1 :**

The problem with the approach used in this system is that a face mask, by definition, obscures part of the face. If enough of the face is obscured, the face cannot be detected, and therefore, the face mask detector will not be applied.

- **Drawback 2 :**

This model does not give the accuracy of how much portion of the face is covered with mask or not.



Solution for Drawback 1:

- To improve the existing face mask detection model further, we should gathered actual images (rather than artificially generated images) of people wearing masks.
- To circumvent the issue, we trained a two-class object detector that consists of a with mask class and without_mask class. Combining the object detector with a dedicated with mask class improved the model in two respects.

Solution for Drawback 2:

- In our model the label consist of an string i.e “mask” or “no mask” and accuracy percentage.

Two phase-Face Mask Detector

Phase 1 : Train Face Mask Detector

Load the Dataset → Train face mask classifier with Keras/TensorFlow

Serialize face mask classifier
to disk

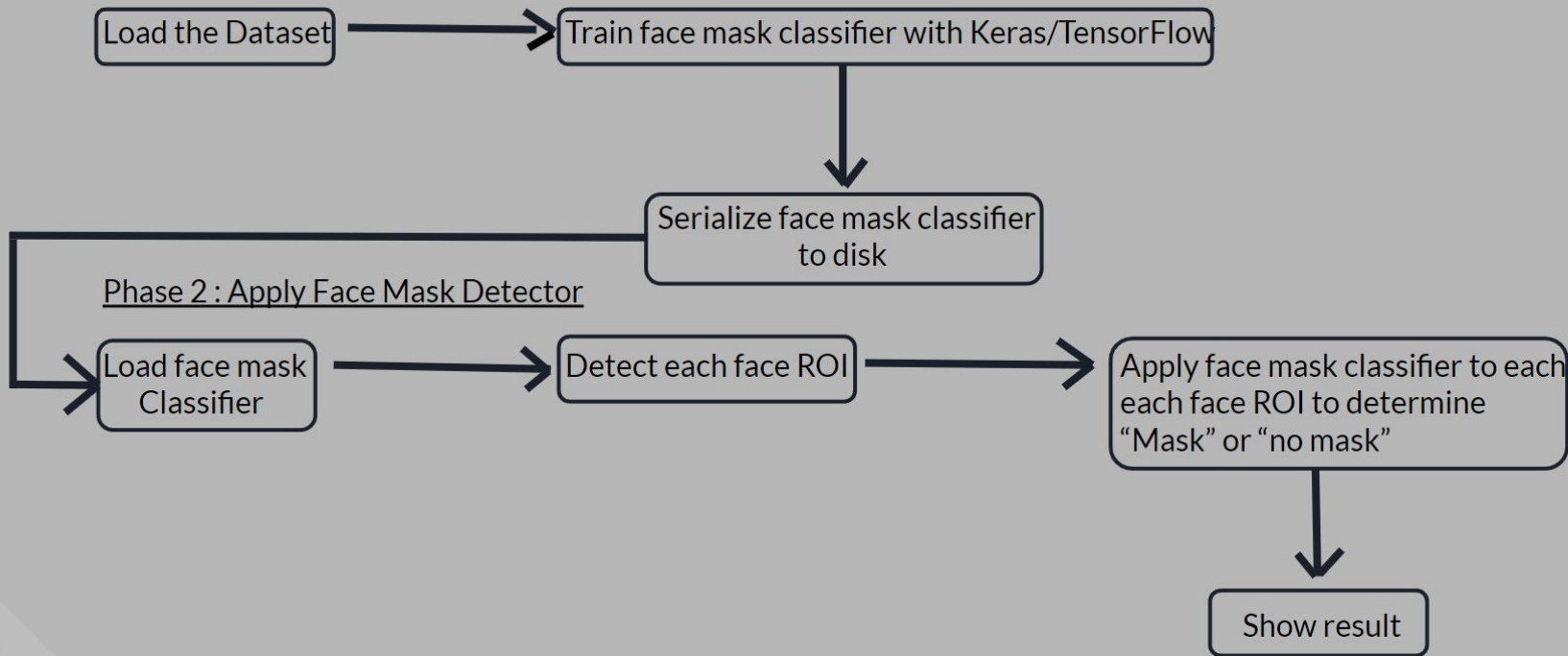
Phase 2 : Apply Face Mask Detector

Load face mask
Classifier

Detect each face ROI

Apply face mask classifier to each
each face ROI to determine
“Mask” or “no mask”

Show result

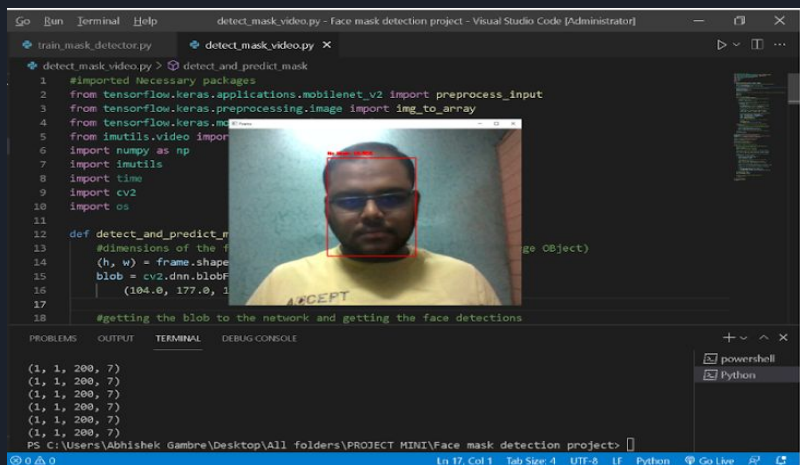




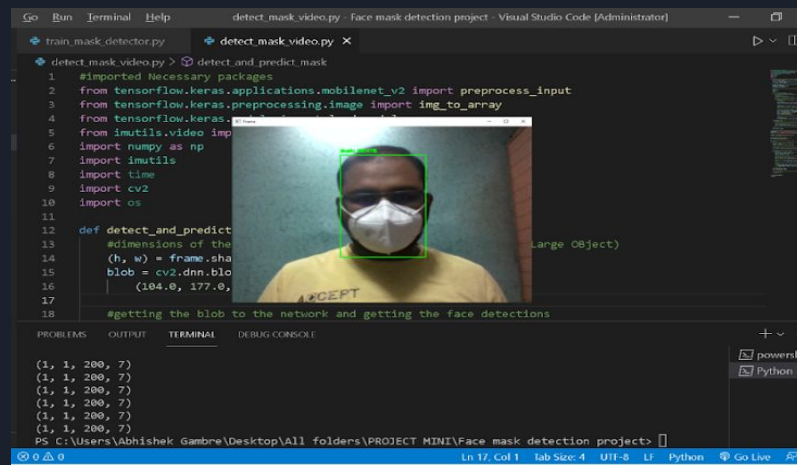
Implementation

- Datasets Collecting : We collect no of data sets with face mask and without masks. we can get high accuracy depends on collecting the number of images .
- Datasets Extracting:We can extract the features using MobileNetv2 of mask and no mask sets.
- Models Training:We will train the model using OpenCV,Keras (python library).
- Facemask Detection :We can detect Pre processing image and also detect via live video . If a person is wearing a mask, it will display a green colour frame over the face,if not then it will display red colour frame over the face.Also it gives the percentage value for how much is the person exposing their face.

Result :



No Mask



Mask



Tools and Software used

- Operating System: Windows 10, 64bit
- Hardware: 8gb Ram, webcam
- Programming Language: Python
- Computer Vision Library: OpenCV
- Libraries Used: Keras, TensorFlow
- Softwares: Visual Studio Code



Conclusion

By the development of face mask detection we can detect if the person is wearing a face mask and allow their entry would be of great help to the society. The accuracy of the model will be achieved and the optimization of the model is a continuous process and So we are building a highly accurate solution. We can prevent peoples from Virus Transmission through this model.



References

- W. H. Organization, “Coronavirus disease (COVID-19) advice for the public: When and how to use masks,” 2020.
<https://www.who.int/emergencies/diseases/novel-coronavirus2019/advice-for-public/when-and-how-to-use-masks>
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Thank You

