FACE MASK DETECTION

A

DISSERTATION OF

Submitted in Partial Fulfillment for the requirement for the Award of Degree of Bachelor of Engineering/Technology

In

Computer Science & Engineering

Submitted To

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL (M.P)

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Session 2022-2023

IES INSTITUTE OF TECHNOLOGY AND MANAGMENT BHOPAL (M.P)

Department of Computer Science & Engineering

CERTIFICATE

This is to certify that the work embodies in this Minor/Major Project entitled "**Face mask detection**" being submitted by "**Anshu Kumari"(0526CS191020)** for partial fulfilment of the requirement for the award of "**Bachelor of Engineering/Technology in Computer Science & Engineering**" to "**Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal(M.P)**" during the academic year 2022-23 is a record of Bonafide piece of work, carried out by him under my supervision and guidance in **IES INSTITUTE OF TECHNOLOGY AND MANAGMENT, BHOPAL(M.P)**.

Guide	H.O.D	Principal
Dr. Anita Soni	**Dr. Nikhat Raza khan**	**Dr. Anuprita Mishra**

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APPROVAL CERTIFICATE

The Major Project entitled "**Face Mask Detection**" being submitted "**Anshu Kumari (0526CS191020)**" has been examined by us and is hereby approved for the award of degree "**Bachelor of Engineering/Technology in Computer Science & Engineering**", for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein, but approve the dissertation only for the purpose for which it has been submitted.

Internal Examiner

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DECLARATION

I hereby declare that the work, which is being presented in Minor/Major Project, entitled "**Face Mask Detection**" partial fulfilment of the requirements for the award of degree of Bachelor of Engineering/Technology in Computer Science & Engineering branch, submitted in the department of **IES INSTITUTE OF TECHNOLOGY AND MANAGMENT** is an authentic record of my own work carried under the guidance of " " I have not submitted the matter embodied in report for award of any other degree.

Supervisor

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Finally I wish to thanks all those Noble hearts that directly or indirectly help me for completion of this work.

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-:Chapter 1:-

1.1-Inroduction

In 2020, the largest pandemic in recent history spread through the world: COVID-19. As of May1st, 2021, there have already been 152 million cases and 3 million deaths around the world . In many regions, those numbers are considerably under-counted . Beyond that, many parts of the world have slowed or stopped due to the human, economic, and social impacts of distancing and protection measures. For the purpose of the ongoing pandemic and predictions for future pandemics, this projesct seeks to create a mask detection system that is capable of recognizing whether people in surveillance-type video streams are correctly wearing their masks.

1.2- Overview

Due to the real-time and real-world deployment constraints of such task, we decided to tackle this problem from two fronts - performance and efficiency. The first pipeline that focuses on accuracy uses a pre-trained face detector to extract faces from the frame, then passes the cropped face stoan image classifier. This mask-wearing classifiers trained on a large-scale synthetic dataset of 180,000 images divided into three classes: mask correctly worn, mask incorrectly worn, and no mask worn. We experimented with various models for this classifier, from traditional machine learning approaches such as random forest and Haarcascades to state-of-the-art computer vision architectures
such as Dense Net and Resent.

-:Chapter 2:-

2.1. Related Works

Projects with similar intent have been quite popular due to the ongoing pandemic. A method was proposed to utilize hear-cascade based feature detectors to individually determine the presence of nose and mouth from a detected face .Their logic follows that no mask is worn if we can successfully detect a mouth from the face, mask is worn incorrectly if we can detect a nose by not a mouth, and mask is worn correctly if we can detect neither a nose nor a mouth. This approach is efficient and intuitive but has severe limitations - it can only process full-frontal faces and one can easily trick the detector by covering their mouth and nose with their hand.

-:Chapter 3:-

3.1 Hardware Requirements

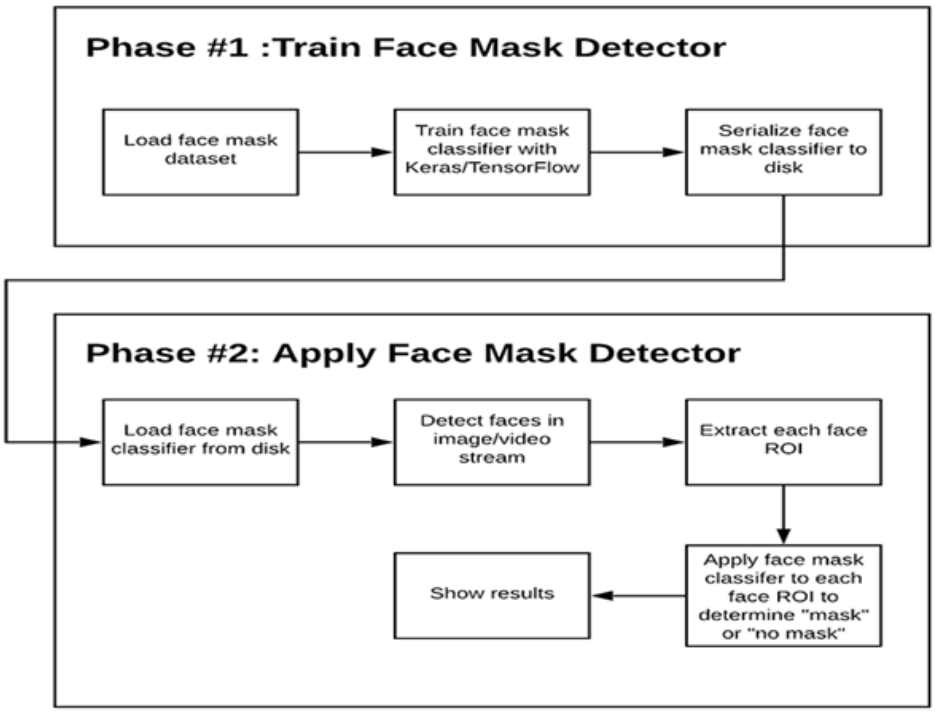
- Working WebCam
- 4 GB RAM and above
- 1TB Hard disk
- 32-bit processor or more
- I3 processor or more
- Operating System

3.2 Software Requirements

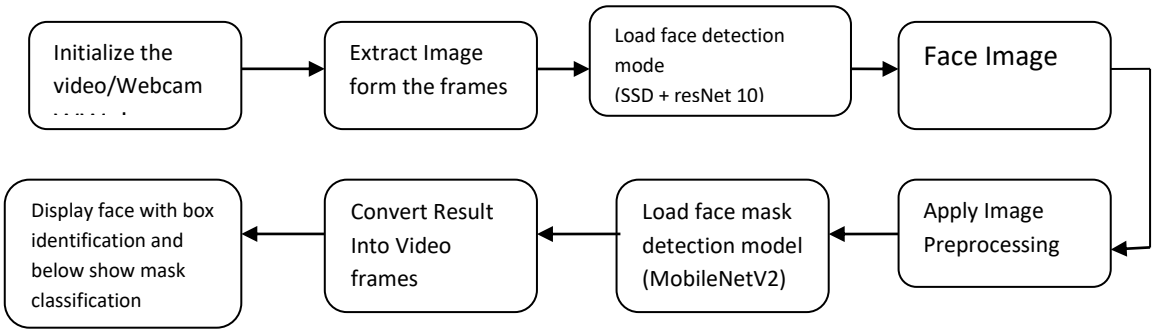
- Python
- OpenCV
- TensorFlow
- Keras
- Imutils

-:Chapter 4:-

4.1 Use case diagram

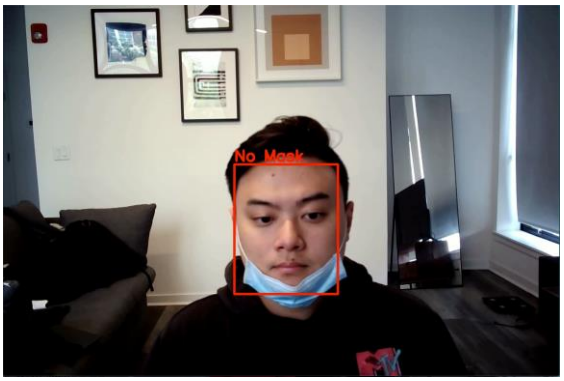


4.2 Face Mask Detection Flow From Webcam

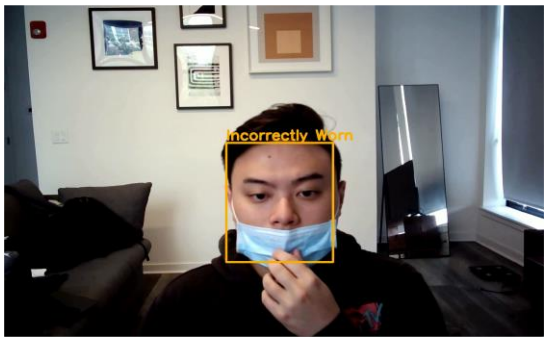


-:Chapter 5:-

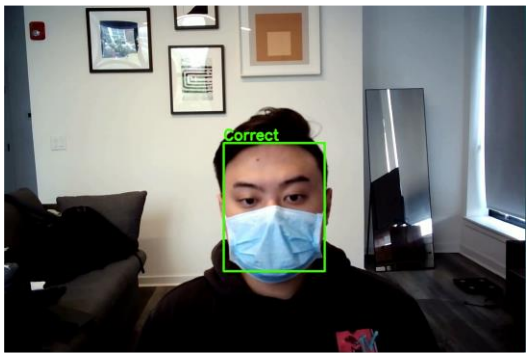
5.1 Project Snapshots



Not Wearing mask Properly



Incorrect Style



Wearing Mask Properly

-:Chapter-6:-

6.1 Future Work

More than fifty countries around the world have recently initiated wearing face masks compulsory. People have to cover their faces in public, supermarkets, public transports, offices, and stores. Retail companies often use software to count the number of people entering their stores. They may also like to measure impressions on digital displays and promotional screens. We are planning to improve our Face Mask Detection tool and release it as an open-source project. Our software can be equated to any existing USB, IP cameras, and CCTV cameras to detect people without a mask. This detection live video feed can be implemented in web and desktop applications so that the operator can see notice messages. Software operators can also get an image in case someone is not wearing a mask. Furthermore, an alarm system can also be implemented to sound a beep when someone without a mask enters the area. This software can also be connected to the entrance gates and only people wearing face masks can come in.

6.2 Conclusion

To mitigate the spread of COVID-19 pandemic, measures must be taken. We have modeled a face mask detector using SSD architecture and transfer learning methods in neural networks. To train, validate and test the model, we used the dataset that consisted of masked faces images and unmasked faces images. The model was inferred on images and live video streams. This face mask detector can be deployed in many areas like shopping malls, airports and other heavy traffic places to monitor the public and to avoid the spread of the disease by checking who is following basic rules and who is not.

6.3 References

[1] COVID-19 map.
[2] Face mask detection dataset.
[4]Data Flair
[4] YouTube.
[5] Face mask detection
[6] Computer society conference on computer vision and pattern recognition. CVPR 2001, vol.
[7]COVID-19: Face Mask Detector With Opencv, Keras/Tensor flow, And Deep Learning