

Face Mask Detection



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Table of Contents

01

Introduction

02

Data

03

Tools

04

Models

05

Results

Introduction:

The Covid 19 pandemic is causing a worldwide health crisis. Wearing a face mask in public places and Wherever else is the most effective safety gear

A project is a web application based on the Django framework
It uses machine learning to teach a system to be able to detect a face mask



Tools:



Django

Html

CSS

Java script

TensorFlow

Matplotlib

Sklearn

Keras

numpy

TensorFlow

matplotlib

Keras

NumPy

Data

resources:

4095 images

image quality:

different quality
close up face only

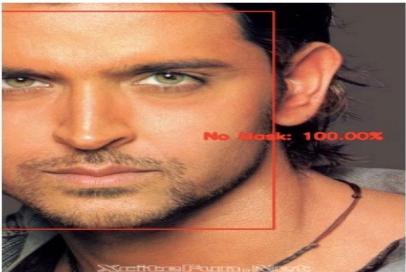
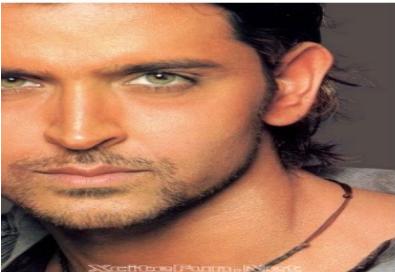
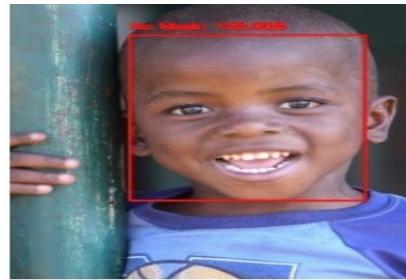
split data:

Training -> 3276 images

Validation -> 655 images

Testing -> 164 images

sorted by each class label



Workflow

01

Data pre_processing

02

Baseline

03

Simple NN

04

CNN

05

TensorFlow
MobileNet_V2

06

Results

CNN

Experiment 1



- 1- AveragePooling2D
- 2- Different size of filters:
(224, 224)
- 3- Flatten
- 4- Optimizer : Adam
- 5-Color: gray &black

Experiment 4



Image Data Generator
rotation range=20,
zoom range=0.15,
width_shift_range=0.2,
height_shift_range=0.2,
shear range=0.15,

Experiment 2

Dropout 0,5 only 5%



Experiment 3



- 1- Dense try 128
- 2- Regularize

Number of photo:

2500 images

accuracy

95%

Baseline

There is over fit

The Solution is to
increase The
number of photo

Validation

98%

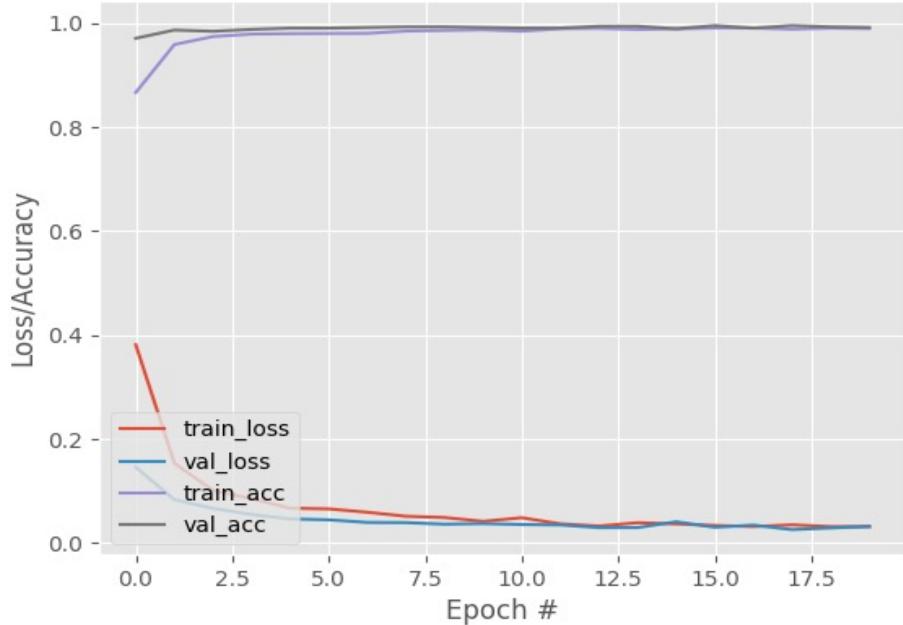
classification report:

	precision	recall	f1-score	support
with mask	0.98	1.00	0.99	433
without mask	1.00	0.98	0.99	386
accuracy	--	--	0.99	819
macro avg	0.99	0.99	0.99	819
weighted avg	0.99	0.99	0.99	819

Transfer Learning Model :

Number of photo : 4095 images

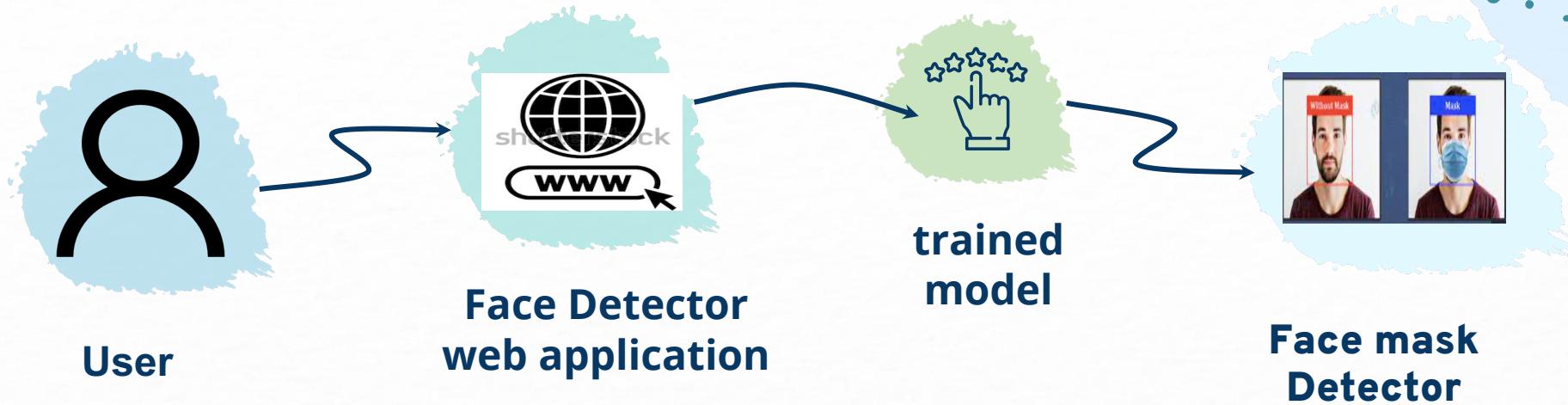
Training Loss and Accuracy



Model	Training	Validation
MobileNet_V2	0.99%	0.99%

Results

Face Detector cloud environment:





Thank you