

LIVE FACE MASK DETECTION USING MACHINELEARNING

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Email id :- vedalasarala@gmail.com**ABSTRACT**

Global pandemic COVID-19 circumstances emerged in an epidemic of dangerous disease in all over the world. Wearing a face mask will help prevent the spread of infection and prevent the individual from contracting any airborne infectious germs. Using Face Mask Detection System, one can monitor if the people are wearing masks or not.

Here HAAR-CASACADE algorithm is used for image detection. Collating with other existing algorithms, this classifier produces a high recognition rate even with varying expressions, efficient feature selection and low assortment of false positive features. HAAR feature-based cascade classifier system utilizes only 200 features out of 6000 features to yield a recognition rate of 85-95%.

According to this motivation we demand mask detection as a unique and public health service system during the global pandemic COVID-19 epidemic. The model is trained by face mask image and non-face mask image.

Keywords: COVID-19 epidemic, HAAR-CASACADE algorithm, mask detection, face mask image, non-face mask image

1. INTRODUCTION**Motivation of Work:**

The world has not yet fully Recover from this pandemic and the vaccine that can effectively treat Covid-19 is yet to be discovered. However, to reduce the impact of the pandemic on the country's economy, several governments have allowed a limited number of economic activities to be resumed once the number of new cases of Covid- 19 has dropped below a certain level. As these countries cautiously restarting their economic activities, concerns have emerged regarding workplace safety in the new post-Covid-19 environment.

To reduce the possibility of infection, it is advised that people should wear masks and maintain a distance of at least 1 meter from each other. Deep learning has gained more attention in object detection and was used for human detection purposes and develop a face mask detection tool that can detect whether the individual is wearing mask or not. This can be done by evaluation of the classification results by analyzing real-time streaming from the Camera. In deep learning projects, we need a training data set. It is the actual dataset used to train the model for

performing various actions.

PROBLEM STATEMENT

The main objective of the face detection model is to detect the face of individuals and conclude whether they are wearing masks or not at that particular moment when they are captured in the image.

2. LITERATURE SURVEY AND RELATED WORK

An Automated System to Limit COVID-19 Using Facial Mask Detection in Smart City Network [1]:

COVID-19 pandemic caused by novel coronavirus is continuously spreading until now all over the world. The impact of COVID-19 has been fallen on almost all sectors of development. The healthcare system is going through a crisis. Many precautionary measures have been taken to reduce the spread of this disease where wearing a mask is one of them. In this paper, we propose a system that restrict the growth of COVID-19 by finding out people who are not wearing any facial mask in a smart city network where all the public places are monitored with Closed-Circuit Television (CCTV) cameras. While a person without a mask is detected, the corresponding authority is informed through the city network. A deep learning architecture is trained on a dataset that consists of images of people with and without masks collected from various sources. The trained architecture achieved 98.7% accuracy on distinguishing people with and without a facial mask for previously unseen test data. It is hoped that our study would be a useful tool to reduce the spread of this communicable disease for many countries in the world.

Masked Face Recognition Using Convolutional Neural Network [2]:

Recognition from faces is a popular and significant technology in recent years. Face alterations and the presence of different masks make it too much challenging. In the real-world, when a person is uncooperative with the systems such as in video surveillance then masking is further common scenarios. For these masks, current face recognition performance degrades. An abundant number of researches work has been performed for recognizing faces under different conditions like changing pose or illumination, degraded images, etc. Still, difficulties created by masks are usually disregarded. The primary concern to this work is about facial masks, and especially to enhance the recognition accuracy of different masked faces. A feasible approach has been proposed that consists of first detecting the facial regions. The occluded face

3. EXISTING SYSTEM

face detection problem has been approached using Multi-Task Cascaded Convolutional Neural Network (MTCNN). Then facial features extraction is performed using the Google Face Net embedding model.

1. This system is capable to train the dataset of both persons wearing masks and without wearing masks.
2. After training the model the system can predicting whether the person is wearing the mask or not wearing mask.

4. PROPOSED SYSTEM

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3. It also can access the webcam and predict the result.

5. IMPLEMENTATION

MODULES

Numpy:

NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays. The ancestor of NumPy, Numeric, was originally created by Jim Hugunin with contributions from several other developers. In 2005, Travis Oliphant created NumPy by incorporating features of the competing Num array into Numeric, with extensive modifications. NumPy is open-source software and has many contributors.

The Python programming language was not initially designed for numerical computing, but attracted

the attention of the scientific and engineering community early on, so that a special interest group called matrix-sig was founded in 1995 with the aim of defining an array computing package. Among its members was Python designer and maintainer Guido van Rossum, who implemented extensions to Python's syntax (in particular the indexing syntax) to make array computing easier.

An implementation of a matrix package was completed by Jim Fulton, then generalized by Jim Hugunin to become Numeric also variously called Numerical Python extensions or NumPy Hugunin, a graduate student at Massachusetts Institute of Technology (MIT) joined the Corporation for National Research Initiatives (CNRI) to work on J Python in 1997 leaving Paul Dubois of Lawrence Livermore National Laboratory (LLNL) to take over as maintainer.

In early 2005, NumPy developer Travis Oliphant wanted to unify the community around a single array package and ported num-array's features to Numeric, releasing the result as NumPy 1.0 in 2006. This new project was part of SciPy. To avoid installing the large SciPy package just to get an array object, this new package was separated and cal

MATPLOTTING:

Mat plot is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter, WX Python, Qt, or GTK+. There is also a procedural "Pylab" interface based on a state machine (like OpenGL), designed to closely resemble that of MATLAB, though its use is discouraged SciPy makes use of Matplotlib.

Matplotlib was originally written by John D. Hunter, has an active development community and is distributed under a BSD-style license. Michael Droettboom was nominated as matplotlib's lead developer shortly before John Hunter's

death in August 2012 and further joined by Thomas Caswell.

You can skip to the next chapter if you are not interested in how and why Python. In this chapter, I will try to explain why I think Python is one of the best programming languages available and why it is such a great place to start.

Python was developed into an easy-to-use programming language. It uses English words instead of punctuation, and has fewer syntax than other languages. Python is a highly developed, translated, interactive, and object-oriented language.

Python translated - Interpreter processing Python during launch. Before using your software, you do not need to install it. This is similar to PERL and PHP editing languages.

Python interactive - To write your own applications, you can sit in Python Prompt and communicate directly with the interpreter.

Python Object-Oriented - Python supports the Object-Oriented program style or method, encoding the code within objects.

Python is a language for beginners - Python is an excellent language for beginners, as it allows for the creation of a variety of programs, from simple text applications to web browsers and games.

use you wish to learn editing but are not familiar with editing languages. Alternatively, you may be familiar with programming languages such as C, C ++, C #, or Java and wish to learn more about Python language and how it compares to these "big word" languages.

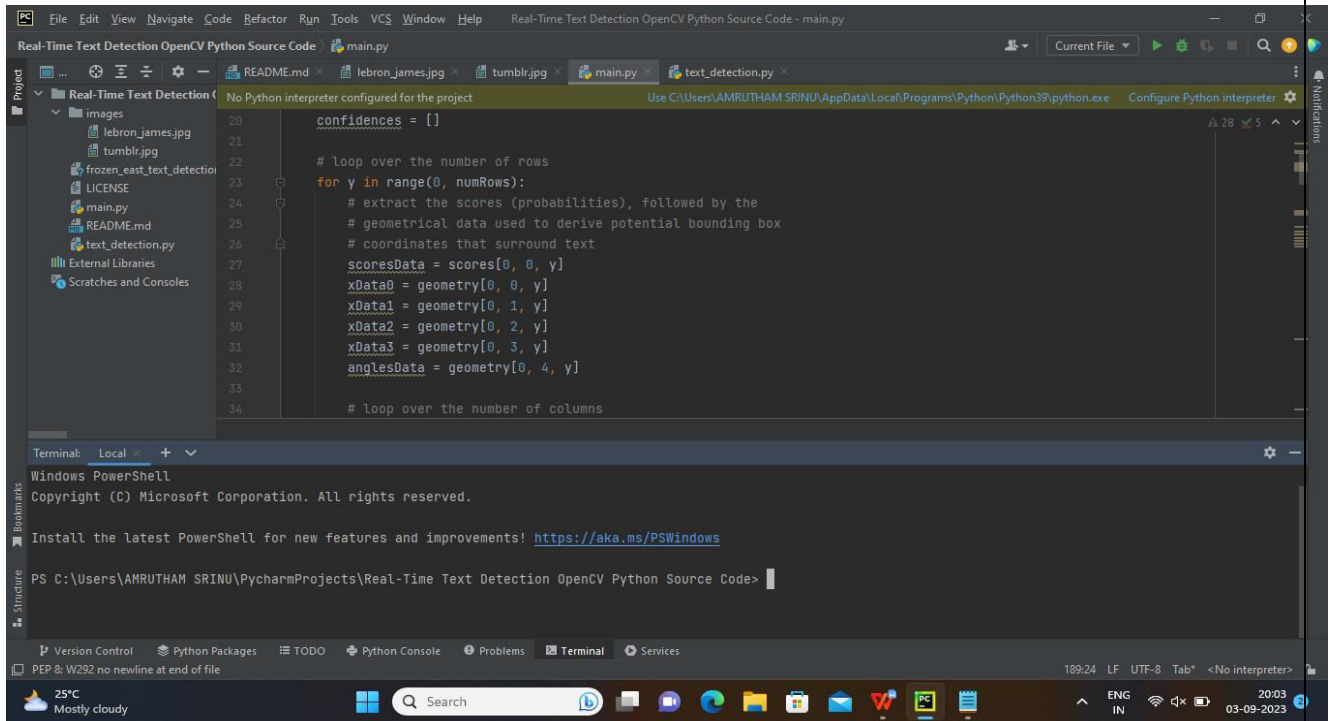
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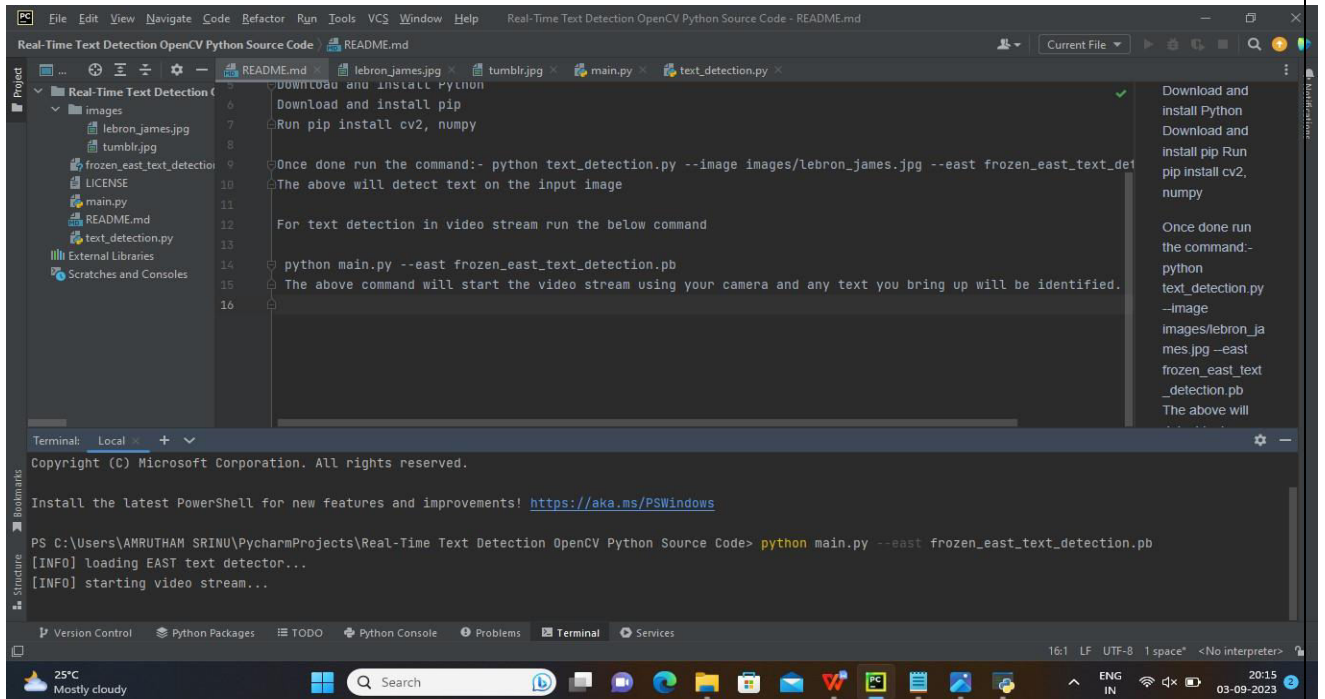
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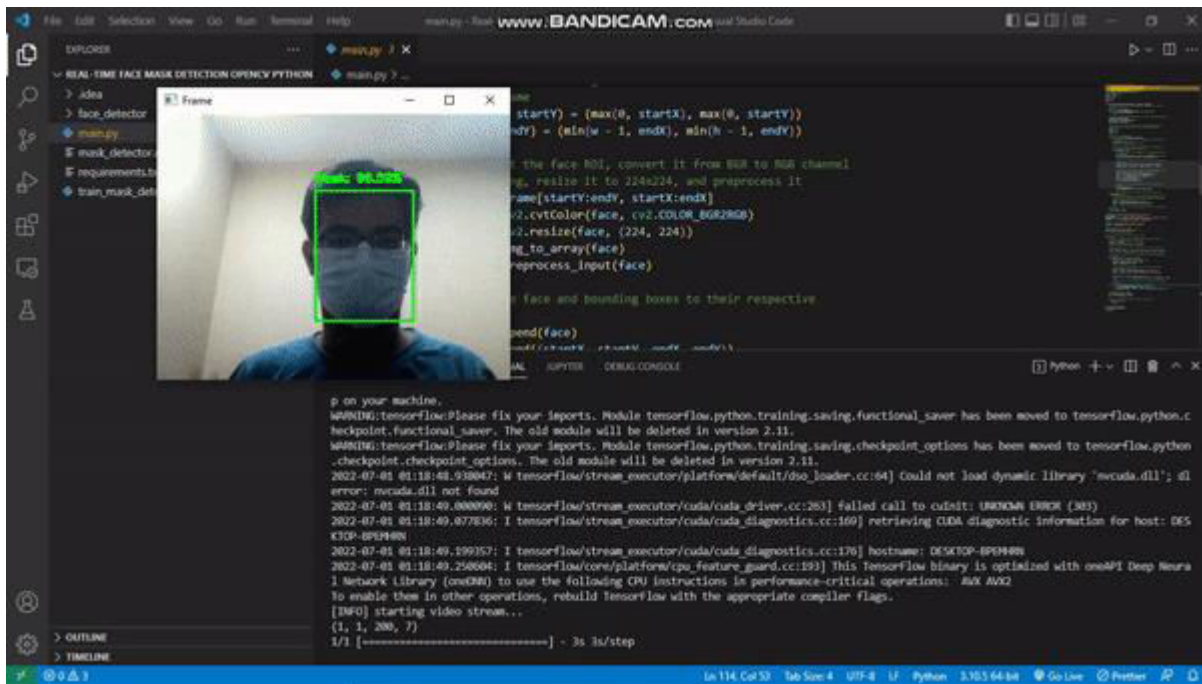
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6. RESULTS AND DISCUSSION SCREEN SHOTS

HOME SCREEN





DESCRIPTION:**OUT PUT:****INPUT AND OUTPUT****INPUT DATASET**

<https://github.com/prajnasb/observations/tree/master/experiemnts/data>

SAMPLE OUTPUT

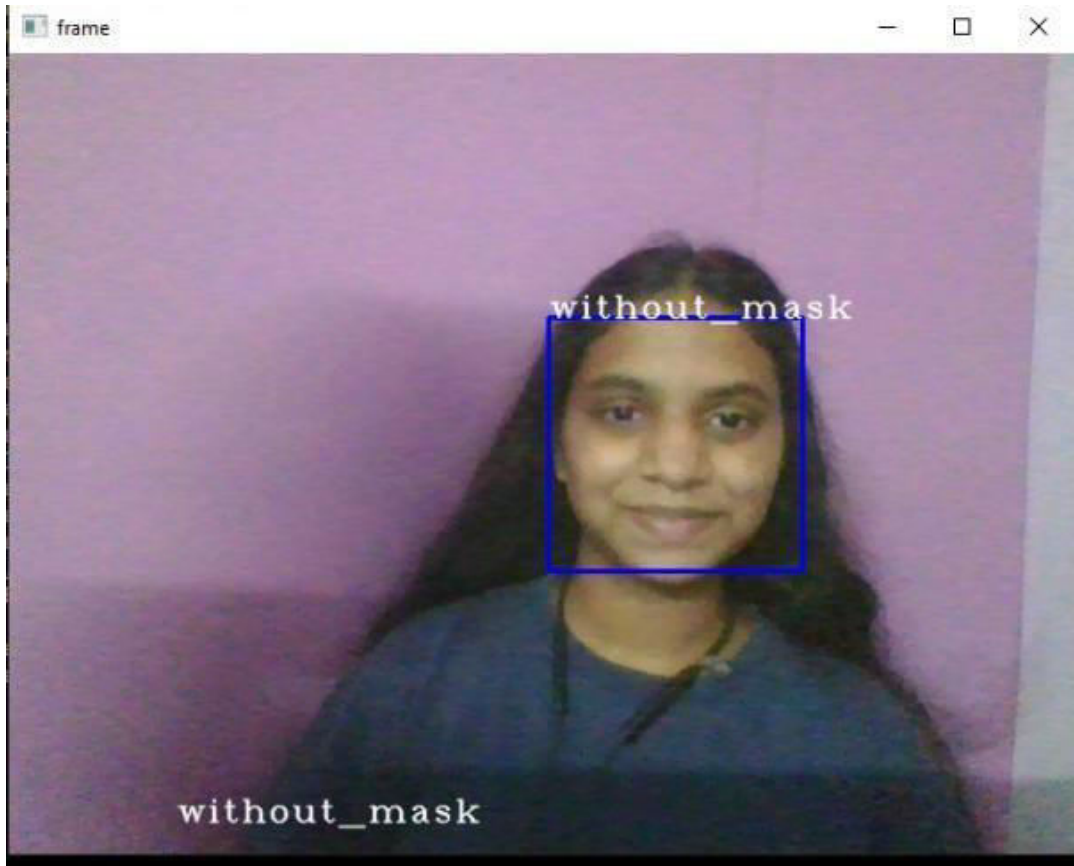
true: without_mask predicted: without_mask



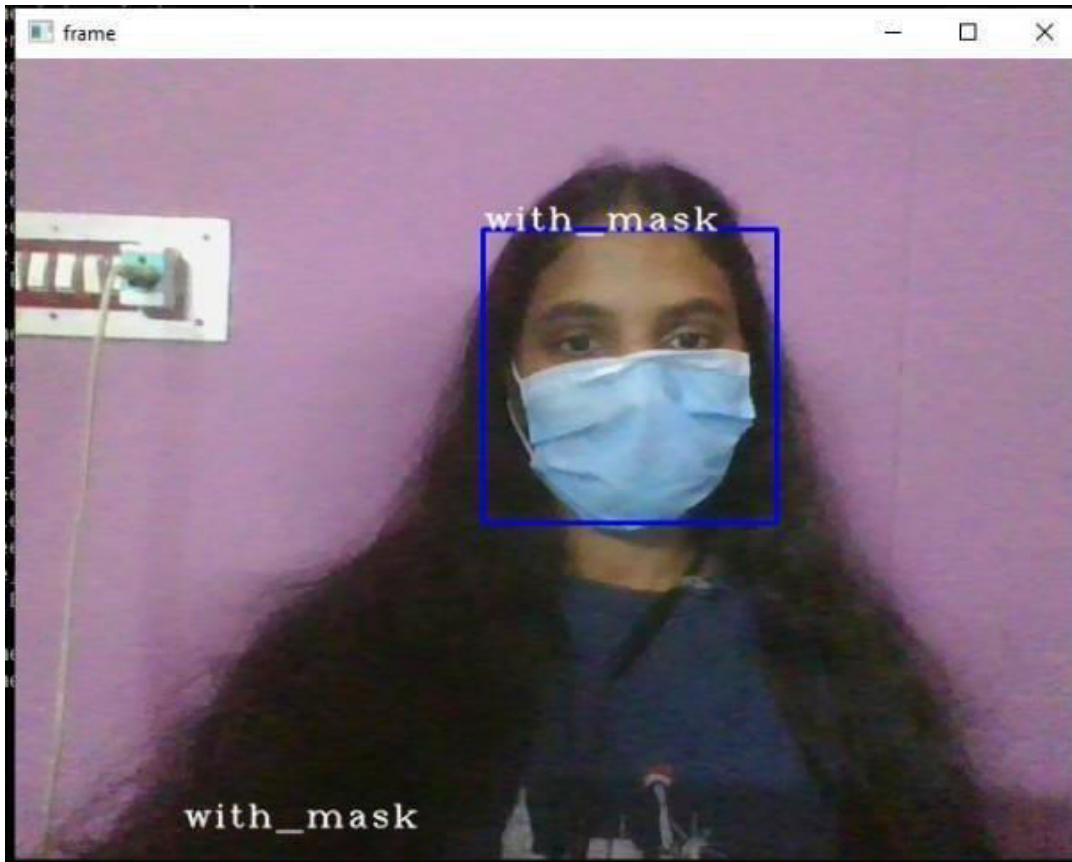
▶ true: with_mask predicted: with_mask



REAL TIME INPUT



REAL TIME OUTPUT



7.CONCLUSION AND FUTURE WORK

CONCLUSION

As the technology are blooming with emerging trends the availability so we have novel face mask detector which can possibly contribute to public healthcare. The architecture consists of Mobile Net as the backbone it can be used for high and low computation scenarios. In order to extract more robust features, we utilize transfer learning to adopt weights from a similar task face detection, which is trained on a very large dataset. We used OpenCV, tensor flow, and NN to detect whether people were wearing face masks or not. The models were tested with images and real-time video streams. The accuracy of the model is achieved and, the optimization of the model is a continuous process and we are building a highly accurate solution by tuning the hyper parameters. This specific model could be used as a use case for edge analytics.

Furthermore, the proposed method achieves state-of-the-art results on a public face mask dataset. 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

FUTURE WORK

Jingdong's recognition accuracy is stronger than 99 percent. We created the MFDD, RMFRD, and SMFRD datasets, as well as a cutting-edge algorithm based on them. The algorithm will provide contactless face authentication in settings such as community access, campus governance, and enterprise resumption. Our research has given the world more scientific and technological strength.

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