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Face Mask Detection Using Deep Learning

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ABSTRACT: The COVID19 virus can be spread through contact and contaminated surfaces. To combat the Corona virus, a wide range of vital equipment is needed. One of such most essential is Face Mask. This device can be very useful in schools and colleges to ensure that students wear a face mask for their protection. This paper presents a simplified approach to achieve this purpose using some basic Machine Learning packages like TensorFlow, Keras, OpenCV and Scikit-Learn. The proposed method correctly identifies the face from the picture and then decides if it has a mask on it or not; if it does not, the information is submitted to the appropriate group. On two separate datasets, the system achieves accuracy of up to 95.77 percent and 94.58 percent, respectively.

   A database has been developed to save the student's records, which will then be submitted to the appropriate coordinator. This will encourage the student to correctly wear the mask.

KEYWORDS: Convolutional Neural Network, Deep Learning, Machine learning, COVID - 19, Face Detection.

I.INTRODUCTION

According to the World Health Organization (WHO)'s official Situation Report

– 205, coronavirus disease 2019 (COVID-19) has globally infected over 20 million people causing over 0.7million deaths. Individuals with COVID-19 have had a wide scope of symptoms reported – going from mellow manifestations to serious illness. Respiratory problems like shortness of breath or difficulty in breathing is one of them. Elder people having lung disease can possess serious complications from COVID-19 illness as they appear to be at higher risk.

To cure certain respiratory viral ailments, including COVID-19, wearing a clinical mask is very necessary. The public should be aware of whether to put on the mask for source control or aversion of COVID-19. WHO stresses on prioritizing medical masks and respirators for health care assistants. Therefore, face mask detection has become a crucial task in present global society.

Face mask detection involves in detecting the location of the face and then determining whether it has a mask on it or not. The issue is proximately cognate to general object detection to detect the classes of objects. Face identification categorically deals with distinguishing a specific group of entities i.e., Face. It has numerous applications, such as autonomous driving, education, surveillance, and soon.

II. LITERATURE SURVEY

1. Mamatas.Kalas,REALTIMEFACEDETECTIONANDTRACKING   USING   OPENCV,   International Journal of Soft Computing and Artificial Intelligence, ISSN: 2321-404X, Volume-2, Issue-1, May- 2014

2. Walid Hariri, Efficient Masked Face Recognition Method during the COVID-19 Pandemic, pp.1-7, July2020

3. Vinitha.V1, Velantina.V2, Covid-19 facemask detection with deep learning and computer vision International Research Journal of Engineering and Technology (IRJET), Volume: 07, pp.1-6, Aug2020.

4. Yassin Kortli, Maher Jridi, Ayman Al Falou, and Mohamed Atri, face recognition systems: a survey, 20(2): 342, pp.1-10, 2020 Jan7.

5. Vinitha.V1, Velantina.V2, COVID-19 FACEMASK DETECTION WITH DEEP LEARNING AND COMPUTER VISION International ResearchJournalofEngineeringandTechnology(IRJET),Volume:07, pp.1-6, Aug 2020

Existing system:

In the existing work deep learning model for face mask detection using Python, Keras, and OpenCV. They developed the face mask detector model for detecting whetherpersoniswearingamaskornot.WehavetrainedthemodelusingKeras with network architecture. Training the model is the first part of this project and testing using webcam using OpenCV is the second part. It can be usedto

- Detect face masks inimages

- Detect face masks in real-time videostreams

- IOT device to scan the presence of mask.

Drawbacks of existing system:

- The Existing model can only detect the presence of mask that wewore.

- It will not display the image of that particularperson.

- It does not detect whether the person has worn the mask properly (i.e.,by covering both nose and mouth).

PROBLEM STATEMENT

Parents are reluctant to send their children to college or school during this covid era because the covid has been rising. Controlling covid necessitates the use of a face mask. However, the majority of students do not wear it. Since this technology respects the instructor, students would be conscious and properly wear their mask. This can make the student feel better, and it can also make the parents feel less concerned.

PROPOSED SYSTEMS

The proposed system focuses on how to identify the person on image/video stream wearing face mask with the help of computer vision and deep learning algorithm by using the OpenCV, Tensor flow, Keras.

1. Train Deep learning model(MobileNetV2)

2. Apply mask detector over live videostream

3. It will make sure that the person has worn the mask correctly by covering one's nose and mouth by accessing the faciallandmarks.
4. It will display the image of that person and will also find the name of the person not wearing themask.

**PROPOSED ARCHITECTURE**:
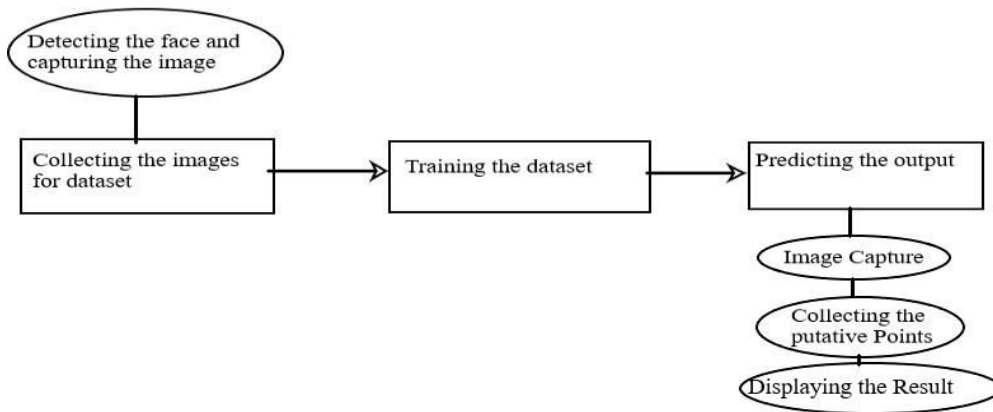
III. METHODOLOGY

We need two different datasets for the face mask to be detected.

- WithMask

- Without Mask

And these datasets can be taken from an external source are we can also design our own datasets with the help of computer vision and OpenCV technique

The names of these datasets are converted into categorical values as **0 – with mask** and **1 – without mask.**

When the window for capturing the image is opened, it will capture the image of thepersonandstoretheimageinwithandwithoutmaskfolders.Theynumberof images in the dataset can be decided by the us and it should given in the looping part. Once the mentioned number of images are captured the window will be automatically closed.
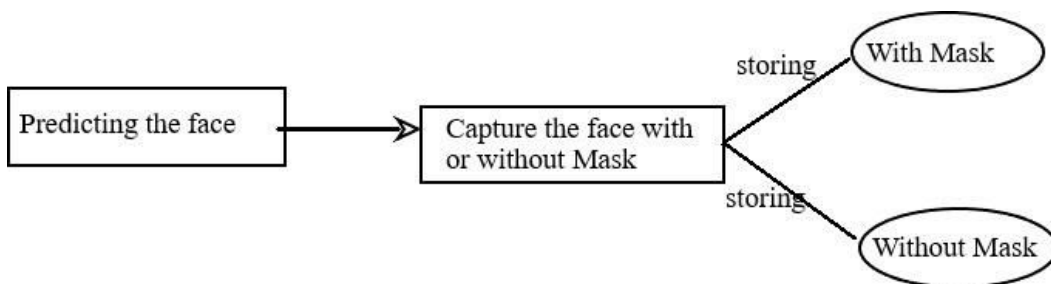
Though Webcam window will Capture the whole person, with the dimension and facial landmarks it will only store the face of the person.

The accuracy and efficiency of your machine learning model are determined by the quality and quantity of your training data. Your model's performance would likely pale in comparison to a model trained on data from 10,000 transactions if you used training data from 100 transactions. When it comes to training data diversity and volume, more is normally better – as long as the data is appropriately labelled. Here we have given 500 images for each dataset and with the help of these dataset the model will be trained accordingly

The Same Window used for collecting the images is again used here for image prediction. Once the window is opened, it will detect the image of the person with the help of facial landmarks like nose, mouth and eyes. It will

differentiate the image as Mask and No mask with the help of training dataset. Once the image is predicted the No Mask image will be captured for furtherprocess.

Then the captured image will be compared with the image in the database and it will display the name of the person.

IV.   RESULT ANALYSIS

The above machine learning technology using convolutional neural network have been developed to predict the presence of mask to ensure the safety of the students in schools and colleges. It will encourage the students to wear the mask properly and safeguard them from the deadlyvirus.

V. CONCLUSION

This mission, which we completed, was an impressive challenge in the fields of college and school. This project will minimize the trigger of covid and will assist teachers in locating students who have not worn the mask and providing them with a reminder to do so. As a result, students would be required to wear masks in class and on campus.

Parents are fearful of sending their children to college or school during this difficult time. They would be less scared if they use this technology, since wearing a mask is a popular way to stop covid.

REFERENCES

[1]   M. Z. Jafari Yazdi and M. Soryani, "Driver Drowsiness Detection byYawn Identification Based on Depth Information and Active Contour Model," 2019 2nd International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT), Kannur, Kerala, India, 2019, pp. 1522-1526, doi:10.1109/ICICICT46008.2019.8993385.

[2]   WHO EMRO | About COVID-19 | COVID-19 | Health topics. [Online]. Available: http://www.emro.who.int/health-topics/coronavirus/about-covid- 19.html, accessed on: Jul. 26,2020.

[3]   P. Viola and M. Jones, "Rapid object detection using a boosted cascade of simple features," in Proceedings of the 2001 IEEE computer societyconference

on computer vision and pattern recognition. CVPR 2001, vol.1. IEEE, 2001,pp. I–I

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