FACE MASK DETECTION USING CLASSIFICATION METHOD

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ABSTRACT As a biosafety precaution, the World Health Organization (WHO) introduced the wearing of face masks after the COVID19 epidemic. This posed challenges to existing facial recognition systems, so this study was born. In this publication, we describe how to create a system that allows you to identify people from images, even when they wear a mask. The face detector in OpenCV is used in conjunction with Based on theMobile NetV2 architecture, a classification model in this way, it is possible to determine whether the face is wearing a mask and where it is situated. To conduct face recognition, A Face Net model is used as a feature extractor and a multilayer feedforward perceptron is used for training facial recognition models using a collection of about 4000+ photographs. Of the images, 52,9 percent came with a face mask and 47,1 percent were without mask. The outcomes of the tests demonstration that determining whether or not someone is wearing a mask is 99.65% accurate. Face recognition accuracy for ten people wearing masks is 99.52 percent, whereas face recognition accuracy without masks is 99.96 percent.

Keywords Face Mask Detection, TensorFlow, Keras, OpenCV, Coronavirus, Data Set, Convolutional Neural Network.

INTRODUCTION The COVID19 pandemic is the biggest life-changing event that has stunned the world since the year started, accordingto the year's calendar. COVID-19, which has impacted the health and lives of many people, has demanded severe procedures to be taken to prevent the spread of illness. Individuals do everything they can for their personal and hence the from the most basic hygienic standards to medical treatments, society's safety is paramount; face masks are one of the private protective instruments. Face masks are worn when individuals leave their homes, and officials strictly enforce the wearing of face masks in groups and public areas. The procedure into two parts: There are many applications of object detection, and one of them is the detection of faces and masks. It can be used in a number of scenarios such as

law enforcement, biometrics, and security. A number of detection systems take remained developed and are currently occupied crossways the world. Altogether of this study, on the other hand, yearns for efficiency, a far better, more efficient way of doing things. Many accurate detectors are needed since the world can no longer afford a growth of Corona instances. In this project, we'll create a mask detector that can tell the difference between people wearing masks and people who don't. We've planned a sight that usages SSD for expression ID and a neural network to recognize the presence of a cover throughout this project. The algorithmic software is used to implement pictures, movies, and animate video feeds.

SYSTEM ANALYSIS

BACKGROUND HISTORY Face recognition has become a hot topic of discussion throughout the world in recent decades. Moreover, with the expansion of technology and, as a result, the fast evolution of computers, extremely important advancements are made. As a result, governmental and private organizations employ facial recognition systems to detect and regulate access to persons in airports, schools, businesses, and other locations. Government agencies, on the other hand, have adopted several safety standards to restrict infections as the COVID-19 epidemic has unfolded. One of these is the requirementthat face masks be worn in public places,since they must be demonstrated. COVID-19 is mostly transferred by droplets created by infected people coughing or an inborn reaction. This spreads the virus to everyone who comes into direct touch (within one meter) with the coronavirus-infected individual. As a result, the virus spreads chop-chop across the areas. With the plaudits for the countrywide lockdowns, tracing and managing the infection has become much more difficult. Face masks are an excellent approach to stop the illness fromspreading. The most efficient technique to prevent the virus from spreading has been proven to be wearing face masks.Governments all throughout the globe have strict laws that require everyone to wear masks when they leave the house. However, some people may not use masks, making it impossible to identify whether or not everyone is wearing one. Computer vision will be useful in such instances. There are no affordable mask notice programmers that can tell if someone is hiding behind a mask. This will boost the demand for a cost-effective method for placing face masks on

people for transit, safeguarding the safety of highly inhabited areas, residential neighborhoods, large-scale factories, and alternative companies This plan uses machine learning organization by means of OpenCV and TensorFlow to identify facemasks listed humans

EXISTING SYSTEM The COVID19 pandemic is the most immensely colossal life-transmuting event that has stunned the world since the year commenced, according to the year's calendar. COVID-19, which has impacted the health and lives of many people, has injunctively authorized astringent procedures to be taken to avert the spread of illness. Individuals do everything they can for their personal and hence the from the most rudimental hygienic standards to medical treatments, society's safety is paramount; face masks are one of the private protective instruments. Face masks are worn when individuals leave their homes, and officials rigorously enforce the wearing of face masksin groups and public areas.

PROPOSED METHODOLOGY To surmount the drawbacks of the subsisting system, the proposed system has been evolved. This projects aim is to monitor that people are following the rudimentary safety principles. This is done by developing a face mask detector system.

SKIN DETECTION: NEURAL NETWORK

- Stochastic Backpropagation.
- Training patterns pre-whitened.
- Learning Rate, h, Decreased with each training approach.
- Train on equal number of Skin and Non-Skin Pixels.

COLOR SPACE OPTIONS AND NETWORK TOPOLOGY

- Choose the number of hidden units you want.
- Color may be expressed in a variety of color spaces.
- RGB, XYD, and HSV are three different color schemes.
- RGB had the least number of false positives.

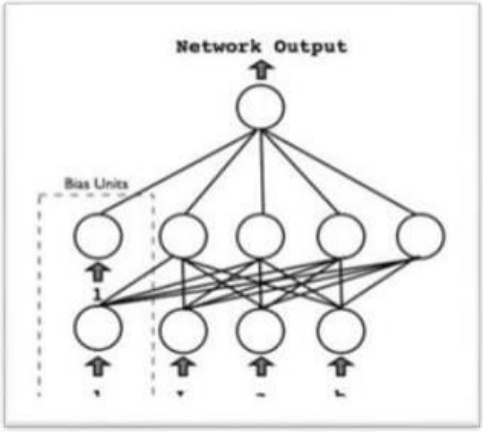

Figure 1. Network Output

EXPERIMENTAL ANALYSIS

DATASET We utilized a dataset with over 4500+ photos, with over 2200 square meters ofshrouded faces and over 2300 square meters of unmasked faces. All of the photos square measure genuine images retrieved from the Bing Search API, Kaggle datasets, and the GitHub dataset. The proportion of images in each of the three sources is equal. The imagesdepict a diverse range of ethnicities, including Asians, Caucasians, and others. The ratio of cloaked to unmasked faces ensures that the dataset is evenly distributed. In our method, we've designated eighty-five percent of the data set as coaching data, and the remaining 15 August1945 as testing data, resulting in a split magnitude relationship of zero. 8:0.2 of the train is used to check the set. Two tenth of the coaching information was used as a collection of validation data in all, 64% of the dataset is utilized for coaching, 16% for validation, and 20% for testing.

Figure 2. Face Mask Dataset

Figure 3. Without Face Mask dataset

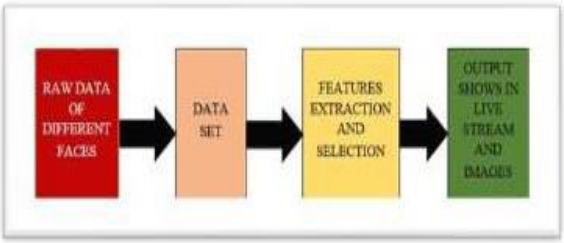

Figure 4. Flow Process Diagram

ARCHITECTURE The initial police investigation has begun. In the second section, we'll look at the presence or absence of a mask on a face due to the presence of numerous faces in a single photo or video stream. To observe the face, we utilized the OpenCV library. The current version of OpenCV has a Deep Neural Network (DNN) module for face recognition that includes a pretrained convolutional neural network (CNN). The new algorithm outperforms earlier models when it comes to face

detection. When a new check image is provided, it is first turned into a BLOBS (Binary giant Object refers to a collection of connected pixels in a highly binary image) before being passed to the pretrained model, which produces the number of recognized faces. By measuring the bounding box around the face and transmitting it to the second component of the model, we can check if it has a mask.

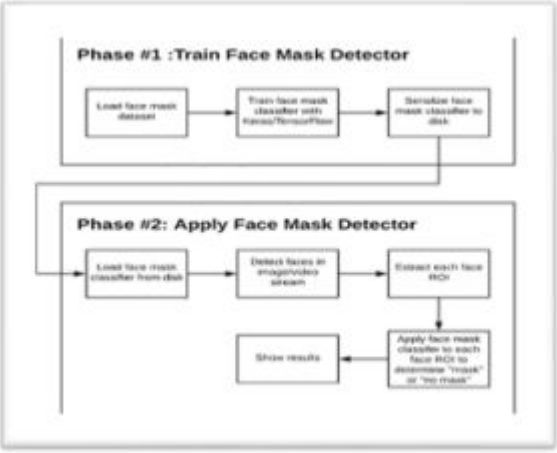

Figure 5. Data Flow Diagram

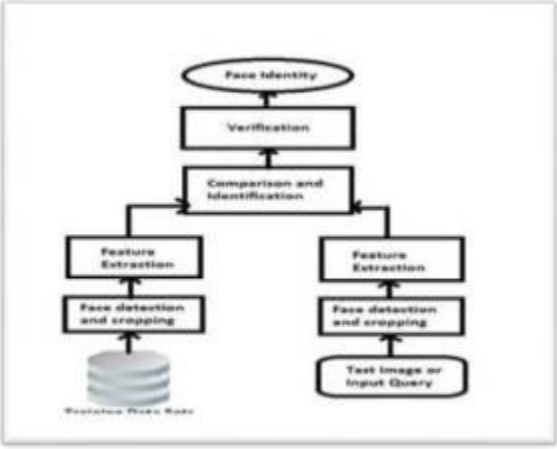

Figure 6. Block Diagram

The developed device will keep track of live video streams but not keep a record of them. This footage cannot be looped, played, or paused, unlike CCTV camera footage, which the admin may rewind, play, or pause. People are motivated to strive to break the rules If the suggested system is implemented strictly, top-level management of the organization is typically notified through letter when somebody is identified without a mask. To maintain track of who entered without a mask, the suggested system usually combines databases from other organizations. A screenshot of the person's face may also be linked in order to serve as an indication with other features.

CONCLUSION AND FUTURE WORK

With COVID cases are on the rise instances throughout the world, A system for swapping employees to examine masks on people's faces is critical. This method fulfils that requirement. This strategy may be employed in public venues such as train stations and shopping malls. It will be useful in companies and large organizations with a large number of employees. This method will be beneficial since it is simple to obtain and save information about the employees working in this company, and it is really simple to identify those who aren't wearing masks, and a message will be issued to each

individual to request Precautions not wearing masks. Face masks have lately been mandatory in more than fifty nations throughout the world. In public places such as supermarkets, public transportation, workplaces, and businesses, people must conceal their faces. Software is frequently used by retailers to the numerical value of individuals that enter their businesses. They could also want to keep track of impressions on advertising screens and digital displays Our Face Mask Detection technology will be updated and made available as open-source software. Our programmed may be used to detect persons without amask using any existing USB, IP, or CCTV cameras. This live video stream for detection may be integrated into online and desktop apps so that the operator can view notification messages. If someone isn't wearing a mask, software operators can also receive an image. Additionally, if someone arrives the area short of wearing a mask, an alarm system can be placed to produce a beep. This programmed, which may be connected to the entering gates, can only be used by peoplewearing face masks

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