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

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LIST OF ABBREVATIONS

MTCNN	-	Multi-Task Cascaded Convolutions Neural Networks
CNN	-	Convolutional Neural Network
CCTV	-	Closed-Circuit Television
MIT	-	Massachusetts Institute Technology
CNRI	-	Corporation for National Research Initiatives
LLNL	-	Lawrence Livermore National Laboratory
PyPI	-	Python Package Index
SIFT	-	Scale-Invariant Feature Transform
HOG	-	Histogram of Oriented Gradients
UML	-	Unified Modelling Language

CHAPTER 1

INTRODUCTION

1.2 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.

1.3 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.

CHAPTER 2

LITERATURE SURVEY

2.1 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.

2.2 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 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.

2.3 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 andwithout wearing masks.

After training the model the system can predicting whether the person is wearing the mask or not wearing mask.

CHAPTER 3

METHODOLOGY

3.1 PROPOSED SYSTEM

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

3.2 TENSORFLOW FRAMEWORK:

Tensor flow is an open-source software library.

Tensor flow was originally developed by researchers and engineers.

It is working on the Google Brain Team within Google’s Machine Intelligence research organization the purposes of conducting machine learning and deep neural networks research.

It is an opensource framework to run deep learning and other statistical and predictive analytics workloads.

It is a python library that supports many classification and regression algorithms and more generally deep learning.

TensorFlow is a free and open-source software library for dataflow and differentiable programming across a range of tasks.

It is a symbolic math library, and is also used for machine learning applications such as neural networks.

It is used for both research and production at Google, TensorFlow is Google Brain's second-generation system.

Version 1.0.0 was released on February 11, While the reference implementation runs on single devices, TensorFlow can run on multiple CPUs and GPUs (with optional CUDA and SYCL extensions for general-purpose computing on graphics processing units).

Tensor Flow is available on 64-bit Linux, macOS, Windows, and mobile computing platforms including Android and iOS.