Face Mask Detection

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ABSTRACT

Coronavirus disease 2019 has become a serious ill health. It's spreading terribly wide thanks to its contact clear behavior and people one who didn't wear mask they're conjointly accountable for spreading coronavirus. Thus United Nations agency declared to wear mask in jammed areas as an interference methodology. Thus to beat this drawback we have a tendency to needed Associate in Nursing economical mask observation system. By the event of machine learning and image process analysis introduce strategies for mask detection. By exploitation image process analysis and machine learning methodology is employed for ascertain mask detection. Mask detection is done through varied strategies. In the main convolutional neural network methodology is employed in my project. The accuracy and higher cognitive process is incredibly high in CNN compared to others.

Keywords: Coronavirus disease 2019, mask detection, CNN, Machine learning, Keras, Open, CV, Arduino.

INTRODUCTION

Face mask detection may be a difficult task. It's necessary to notice mask for his spreading speed In my project we have a tendency to notice an individual World Health Organization had wear a mask or not. If person we have a tendency tour a mask then we have a tendency to open gate and permitting to enter in operating space and people one who failed to wear mask we deny his entry. Thence several countries following the rule like “No entry while not mask”. Mask detection is incredibly vital issue in security purpose and Covid-19 interference. Within the case of medical field, mask reduces potential exposure risk from AN infected person whether they have symptoms or not. Mask detection is employed in Airports, Hospitals, Offices and academic Departments etc.
So mask detection is become an awfully crucial and difficult issue. The face recognition while not mask difficult however face recognition with mask is crucial one as a result of feature extraction of covert face is incredibly complicated than traditional face. That's numerous face options like nose, mouth and chin area unit absent within the covert face. In medical field, mask reduces risk from infected person whether they have symptoms or not.

Proposed Work

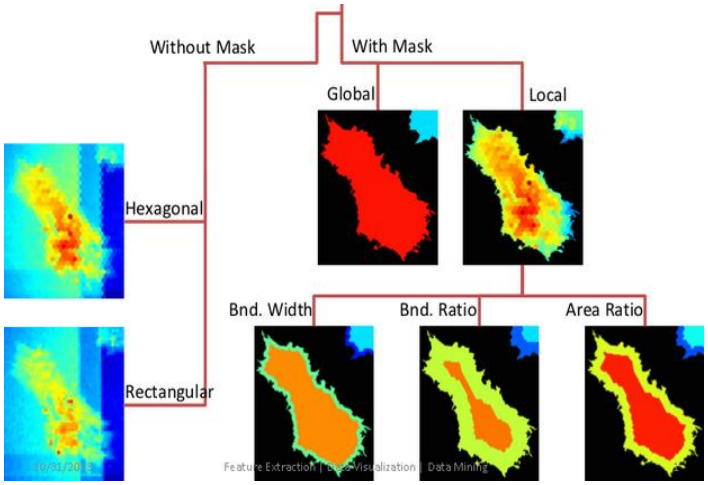
1) Face Recognition
2) Feature Extraction

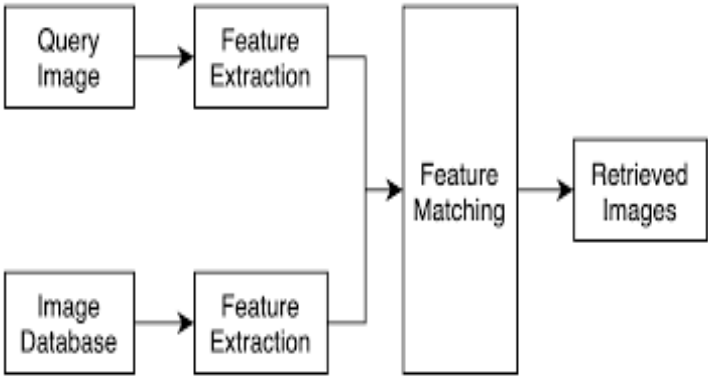
Face recognition is that the 1st step; here we'd like to notice the face from a picture. Primarily there's a problem like detect the multiple mask and unmasked faces in a picture. It is resolved by employing an ancient object detection methodology.
The normal face detection algorithms are used Viola-Jones formula, adaptation Boost formula and HOG (Histogram of Gradient).The article detection methodology is assessed as multi-stage detectors and single short detectors. Quicker RCNN is enclosed in multi-stage detectors and YOLO (You solely Look Once) and Single-Short Detection (SSD) enclosed in Single Stage Detectors. Here such a big amount of papers are studied regarding mask detection. Many techniques are used for mask detection like video analytic, image linguistics segmentation, from fingerprints, DWT (Discreet wave transform) and LBP (Local Binary Pattern).

Feature Extraction-

Feature extraction refers to the method of reworking data into numerical options that may be processed whereas conserving the information within the original data set. It yields higher results than applying

machine learning directly to the raw data.





Feature extraction for image data represents the fascinating elements of a picture as a compact feature vector. Within the past, this was accomplished with specialized feature detection, feature extraction, and have matching algorithms. Today, deep learning is prevailing in image and video analysis, and has become familiar for its ability to require raw image knowledge as input, skipping the feature extraction step.

Dataset

We collect our own dataset . The dataset is in two forms ie with mask and without mask .

WithoutMask

With Mask

Technology Used-

a) Tensor Flow

TensorFlow, an interface for expressing machine learning algorithms, is utilized for implementing ML systems into fabrication over a bunch of areas

of computer science, including sentiment analysis, voice recognition, geographic information extraction, computer vision, text summarization, information retrieval, computational drug discovery and flaw detection to pursue research .

b) Keras

Keras provides basic reflections and building units for creation and transportation of metric capacity unit arrangements with high iteration rate. It takes full advantage of the measurably and cross-platform capabilities of TensorFlow. The core information structures of Keras area unit layers and models [19]. All the layers utilized in the CNN model area unit enforced exploitation Keras. Along with the conversion of category vector to the binary class matrix in processing, it helps to compile the general model.

c) Open CV

Open CV (Open source computer Vision Library), an open source computer vision and ml software library, is used to differentiate and acknowledge faces, acknowledge objects, cluster movements in recordings, trace progressive modules, follow eye gesture, track camera actions, expel red eyes from footage taken utilizing flash, find comparative footage from a picture info, understand landscape

Training of Model-

After apply all the technology we train our model .
Firstly we split our data into two parts first is training data and second is testing data. 80% of total data is know as training data and rest data is know as testing data.

In the training we provide data to the model and it trains on that data.

Testing of Model-

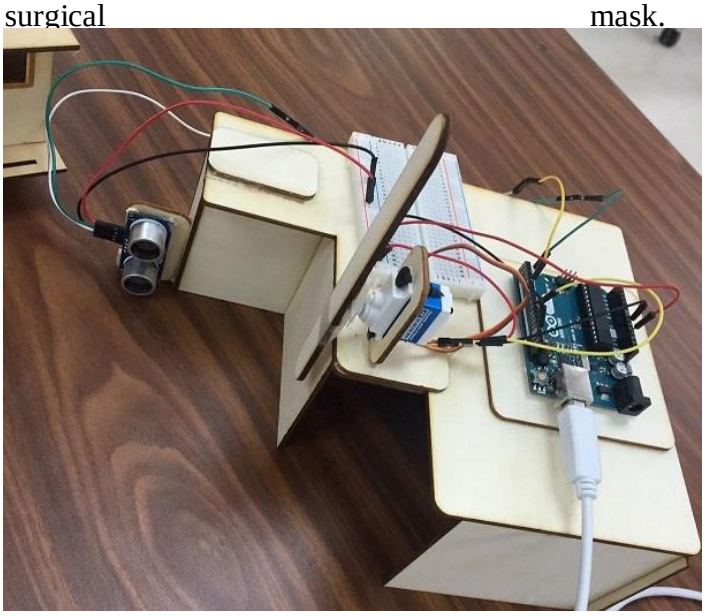
Other 20% data we used for testing of model.we provide data to the model and check what is the accuracy of our model.My model's accuracy ig 97%.

Working

First we check a person has wear a mask or not. If person is wear a mask then by the help of servo motor we open the gate . If a person did not wear a mask then gate is not open and it deny his entry. and set up. markers to overlay it with increased reality and so forth.

Literature

So many papers are studied regarding the face recognition while not mask. However a couple of papers are targeted regarding face with mask [8] mentioned regarding the recognition accuracy of masked face and non-masked exploitation PCA (Principal Analysis Component). It offers face without mask give higher recognition rate. The recognition accuracy drops to but less than 65% when face is masked. In [10] the authors developed a new mask carrying condition as well as correct mask wearing, incorrect mask wearing, and no mask carrying. It achieved 98.70% accuracy within the face detection part. In [9] the authors developed a system for detecting the presence or absence of medical mask within the operating room. During this approach to trigger an alert just for medical employees who don't wear a surgical mask.



CONCLUSIONS AND FUTURE WORK

The artificial intelligent (AI) and machine learning (ML) are developed varied models for mask detection. During this article, mentioned regarding various ways are used for facial mask detection. As we all know these days mask detection may be a terribly difficult task. The applications of Facial Mask Detection are used particularly for the prevention of spreading Coronavirus, following & distinguishing criminals and anti-spoofing etc. By using a Deep Convolutional Neural Network rule, we will simply observe the facial mask. However the facial mask detection and non-masked face detection accuracy provided high variations.

Some benefits of my model are as follows-

1)- It is very easy to deployed anywhere.

2)- It is less costly from any other model.

3)- Accuracy of model is very high.

4)- Using this model Corona virus spreading speed is slow and using this model we will control corona virus.

In future by facial mask recognition we deny entry of a person who did not wear a mask in cinema hall , Phoenix malls , Hospitals and many other places. We can also apply penalty against him. These are the future work of my model.

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