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Face Mask Detection System Using CNN

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ABSTRACT: This day's face mask is necessary to wear because of Covid-19 situation. By which it may be possible wearing mask can become normal to our daily life style. So as per the situation Face Mask Detection System will help the society. So, for the Face Mask Detection System we are using Machine Learning packages like Open CV, Tensor Flow, Keras and Scikit-Learn. This Face Mask Detection System face from the image captured via webcam and identifies the person wearing mask or not. It also detects the face with mask with motion. This software also captures images and save it to file directory and it also give alert sound (Beep) if the person is not wearing mask.

KEYWORDS: Open CV, Keras, TensorFlow and Scikit-Learn.

I. INTRODUCTION

The main concept of the project system is to detect the location of the face in the frame and then check that whether it has mask or not. Face detection deals with distinguishing a group of entities or Face. There are numerous applications, such as autonomous driving, education. This system's accuracy up to 96.76% respectively on two different datasets. It can also scan multiple faces at a time which is lot of helpful to detect unmasked person in crowded area most probably like hospital, airport, mall, etc. The basic packages we are using Machine Learning packages such as Scikit-Learn, Open CV, TensorFlow, Keras.

II. LITERATURE REVIEW

1. Humans have not that much ability to stand/sit on one place and see other person are wearing mask or not at that point this face detection system can work and recognise the faces of person. In We are also using Open CV, Keras, TensorFlow in this system. Also, we are using neural Network to detect face in the Video Stream and mob net CNN architecture model in our system.
2. This system can work in public places like Airport, Railway station, Bus Station, Super Market, Malls or traffic areas to keep eyes on people who are not wearing mask to decrease spread of virus and disease.
3. Face mask detection system consist of dual stage architecture (CNN) which is capable to detect those faces are masked or not masked with webcam, Camaras. For this system Datasets are collected some of from internet, some are scraped from websites on internet.
4. Recognition of face mask in this process system will recognize whether the face have mask or not. The techniques of deep learning are going to applied to construct the classifier which will collect the images of a person's wearing a face mask and other one with not wearing mask.
5. If the face detected with no mask, then system will alert by beep sound and also takes snapshots of face without mask and save it to the file directory.

III. DESIGN

1.1 Architectural model Face Mask Detection System

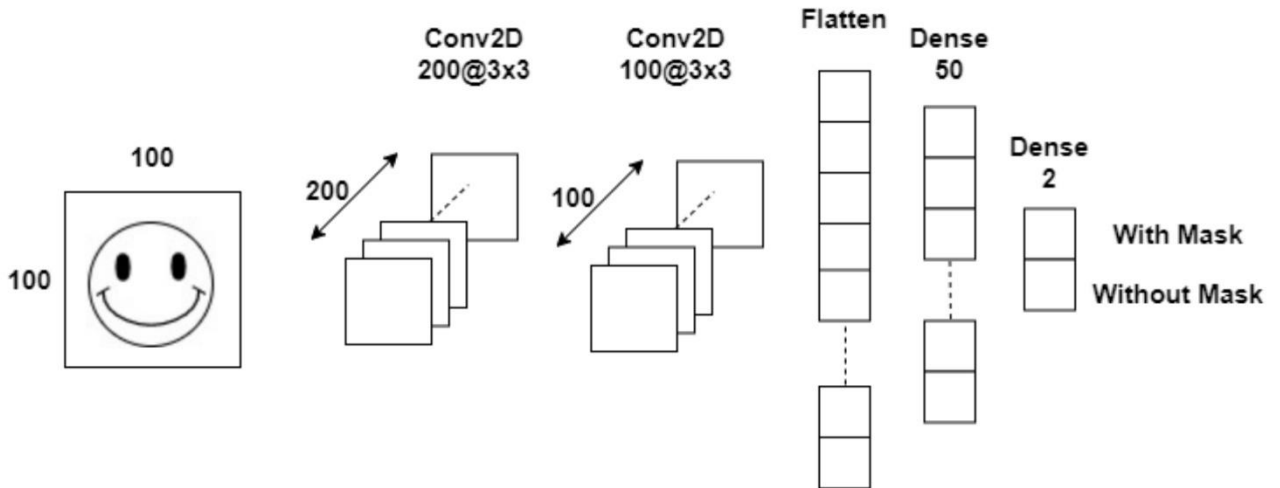


Fig-1: Architectural model for CNN, training, Testing

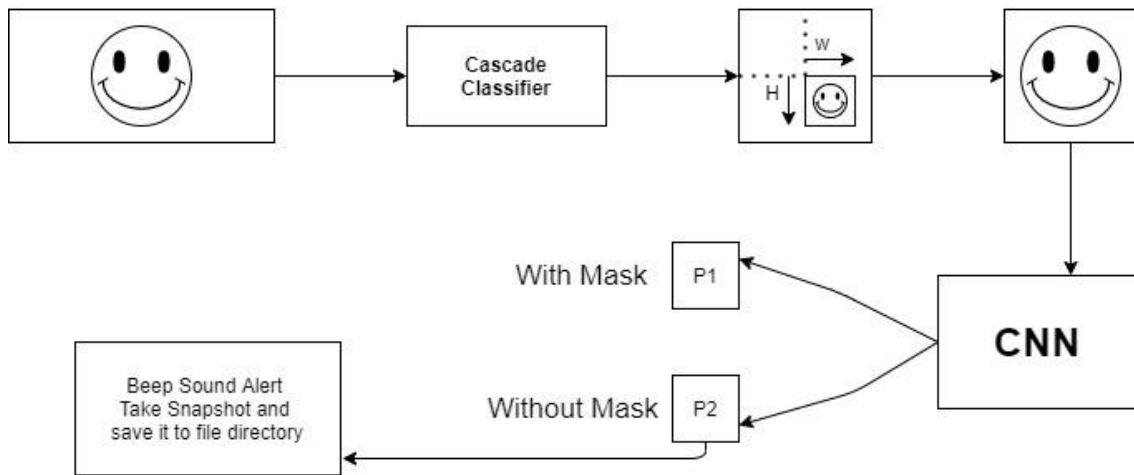


Fig-2: Architectural model for Face Mask Detection System

1.1 Methodology

Requirements for implementing Face mask Detection System by using python programming language and Deep learning, Computer vision, Python libraries, Machine learning. And the architecture is of Mobile net. We are also using CNN algorithm in our face mask detection system.

IV. WORKING

We will extract the data that we collected Dataset with mask and without mask with the help of Mobile Net v2 then we will train our model with using Open CV, Keras, and many python libraries. Then the goes through various layers such as Conv2D, MaxPooling2D, Dense, Dropout in the last layer we use a function named as ‘SoftMax’ to the output vector that gives the probability of the two classes. And after we will detect that the preprocessing image or live videos if the person is wearing mask, then in the frame the on face a rectangle will occur in green color with written on it “mask- ‘Accuracy as per Model’” and if it is not wearing mask then another rectangle on it with color red and written on it “no mask-”.and it will also make alert using beep sound and take snapshots of face in frame save it to file directory if it is not wearing mask.

4.1 Benefits

1. It is difficult for human to check that person is wearing mask or not every time.At that time this system can help in detecting and work easy for society.
2. This system make alert by beep sound if it is not wearing mask.
3. It saves image of face if person is not wearing mask

V. RESULTS AND CONCLUSION

With this system we can detect it the person’s face to check whether the face have mask or not. And then if the person is not wearing mask. Then that person can’t enter that area until he wears mask. Or the admin can take actions as per their rules or protocols. By this system we can prevent the spread of virus in society.

VI. FUTURE WORK

The future scope for this project is we can make automatic door system using thiswhich will open dooronly if person is wearing mask else it will remain closed until the person wear mask and this system can be implemented in Supermarket, ATM, Hospitals, Clinics, etc.

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