

# The Face Mask Detection

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***Abstract-***As for the prevention, wearing a face mask is essentials while going outside or meeting to others. However, some irresponsible people refuse to wear face mask with so many excuses. Moreover, developing the face mask detector is very crucial in this case. This paper aims to develop the face mask detector which is able to detect any kinds of face mask. We have collected data for masked and unmasked people and used it further to create a model for detection.

***Keywords-***Mask detector ,SVM,deep learning.

## 1.INTRODUCTION

The spread of COVID-19 is increasingly worrying for everyone in the world. This virus can be affected from human to human through the droplets and airborne. According to the instruction from WHO, to reduce the spread of COVID-19, every people need to wear face mask, do social distancing, evade the crowd area and also always maintain the immune system. To overcome this situation, a robust face mask detection needs to be developed. Here we developed a Model using SVM and CNN which helps to identify if a person is wearing mask or not. We have taken 2 dataset consisting of masked people and unmasked people respectively. Here we train our model using these dataset.



## 2.METHODS

1.SVM-“Support Vector Machine” (SVM) is a supervised machine learning algorithm which can be used for both classification or regression challenges. However, it is mostly used in classification problems. In the SVM algorithm, we plot each data item as a point in n-dimensional space (where n is number of features you have) with the value of each feature being the value of a particular coordinate. Then, we perform classification by finding the hyper-plane that differentiates the two classes very well.

2.CNN-A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other. The pre-processing required in a ConvNet is much lower as compared to other classification algorithms. While in primitive methods filters are hand-engineered, with enough training, ConvNets have the ability to learn these filters/characteristics.

KNN:

The k-nearest neighbors (**KNN**) **algorithm** is a simple, supervised machine learning **algorithm** that can be used to solve both classification and regression problems. It Calculate the distance between test data and each row of training data. And then Sort the calculated distances in ascending order based on distance values. And then Get top k rows from the sorted array. And Get the most frequent class of these rows.and then predict the class .

### ● 3.RELATED WORK

#### 1. Preprocessing :

- Import numpy ,pandas , matplotlib ,sklearn ,open cv ,keras library
- Mount with google colab
- Import the data
- Create a data frame which contain with mask data set, without mask dataset , and image in array format
- For converting image to data array we use open cv's imread function
- Then resize the array and flatten it
- Create a csv file and download it for further processing.

#### 2. Face Detection Standard Method (Viola Jones Object detection )

- Haar feature Selection
  - Creating an integral image
  - Adaboost training
  - Cascading Classifier
- For mask detection we change some thumb rule and apply same kind of algorithm

#### 3. For mask detection we use 3 measure algorithm

- SVM
- KNN
- CNN

### 4.PARAMETERS

#### 1. SVM :

- For better result we put c value is high ,
- Gamma as scale, and
- Kernel as rbf
- Decision function ovo

#### 2. KNN :

- N\_neighbors = 3
- Weight = uniform

#### 3. CNN :

- Using keras
- Activation function sigmoid
- Padding = same

- Kernel initialization he\_uniform
- Loss squad uniform

#### 4.ANALYSIS AND RESULTS

We observed CNN gave as higher accuracy compared to svm as Knn . data set very large so due to large no of feature svm accuracy is less . CNN and SVM both are time consumers .

We set 50% data for training and 50 % for testing .

#### 5.CONCLUSION

We created the following model using provided dataset and after training and testing our model on different parameters we conclude that the maximum accuracy is provided by CNN algorithm than by SVM and least accuracy we get is from KNN.