

MASK vs NO-MASK CLASSIFICATION

Project Report

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Abstract

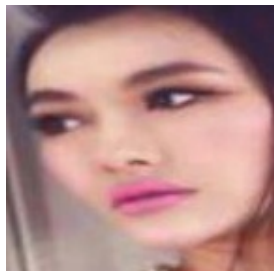
Due to the pandemic situation ,its has become necessary to wear masks to prevent the spread of corona virus.In public places or at offices people should enter if they wear masks.So we need a system which can automatically detect whether a person is wearing mask or not. Hence we implemented a project which can classify whether a person is wearing a mask or not.

I. EXPLORATORY DATA ANALYSIS

Since the data we have was in image format so first we converted the images into an array of numbers which represent pixel and rgb values.

This can be done using *imread* function of OpenCV library.

An exmaple of no mask image



An example of image with mask



After gathering the data we splitted it into training and testing in an equal amount. One thing to note is that data was highly imbalanced. It contains more samples of No Mask data and less samples of Masked data. So we will use F1 score as the evaluation metric which can handle imbalance data and moreover we will also apply class-weight='balanced' to somewhat balance the data. Class 0 represents without mask while class 1 represents with mask.

II. TRAINING AND MODEL EVALUATION

A.

Trained the Support Vector Machine as it is an amazing machine learning model when it comes to classification.

1) : kernel = 'rbf' F1 score : 0.6952380952380953

2) : kernel = 'linear' F1 score : 0.5572916666666665

B.

Trained the Logistic Regression model since it can perform better on binary classification.

1) : F1 score : 0.5610738255033557

C.

Next we trained the data on Multi Layer Perceptron model. The size of hidden layers used is :

$$\frac{2}{3} * (\text{input layer size}) + \text{output layer size}$$

i.e. around 1570

1) : F1 score : 0.6490066225165563

D.

Model Comparison

The ranked performance of each model found is:

SVM('rbf') > MLP > LogisticRegression > SVM('linear')

III. CONTRIBUTION OF EACH MEMBER

PIYUSH : Exploratory data analysis

PENTA SRUJAN : Model evaluations and comparisons

ACKNOWLEDGMENT

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