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**Abstract of proposed Minor Project (Internship) on**

**Face Mask Detection using**

**OpenCV and SVM**

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**Project Introduction--------**

In this Project I am going implement face mask detection using **OpenCV** and **Support Vector Machine** (A Supervised machine learning algorithm) from scratch. Now a days it has become compulsory for all peoples to wear a face mask to shield themselves from COVID19 and also government is taking strict actions against those who are not using mask while they are outdoors. This project can be helpful for the government to detect who all are not wearing marks in public areas .Also it helps all the banks & shop owners to know if anyone who enters in their area is wearing a mask or not. If anyone is not wearing a mask then the person must not be permitted in that area. Thus to solve this problem of face mask detection we don’t require any security who keeps a watch on people but instead we can integrate a software that uses camera . With the help of this camera it continuously clicks pictures of humans and detect whether they are wearing a face mask or not.

**Tools , Technology and algorithm requirements---------**

* Python
* OpenCV
* SVM machine learning algorithm
* A Web Camera

**Steps to build this model from scratch-------------**

* Firstly install OpenCV in Jupyter Notebook using the pip command.
* Now we are ready to execute the basic image processing steps using OpenCV library. Then we load the OpenCV package and read the image .
* We get the image in the array format and we can visualise the image using the matplotlib library of python.
* Now we will be able to open the image in a separate tab.
* Now we are going to detect face from an image using face detection algorithm that was introduce by Viola and Jones.
* The face detection algorithm stages-
* Haar features selection
* Integral images
* AdaBoost
* Cascading classifier

We also have a XML file which is help us to detect faces from any image.

* Collect face data with and without mask and concatenate then so that they can be used to train the data.
* Train the data using SVM (Support vector machine ) a supervised machine learning algorithm,
* After training the data on training data we can perform face recognition on test data or a new data (image) that comes in.
* Finally, we can test our faces with or without mask and test whether this algorithm is able to detect if we are wearing a mask or not .

**Conclusion---------**

**We are able to detect whether a person is wearing a Face mask or not with the help of OpenCV and SVM with an accuracy of 97%** and it can be used in various public places ,offices, banks etc.