# FACE MASK DETECTION USING OPEN CV

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## INTRODUCTION

The COVID19 pandemic is the biggest life-changing event that has stunned the world since the year started, according to the year's calendar. COVID-19, which has impacted the health and lives of many people, has demanded severe procedures to be taken to prevent the spread of illness. Individuals do everything they can for their personal and hence the from the most basic hygienic standards to medical treatments, society's safety is paramount; face masks are one of the private protective instruments. Face masks are worn when individuals leave their homes, and officials strictly enforce the wearing of face masks in groups and public areas.

## MOTIVATION

The motivation behind the project for face mask detection using OpenCV stems from the need to enforce public health measures, specifically the usage of face masks, during the COVID-19 pandemic. Face masks have been proven to be an effective way to reduce the transmission of respiratory droplets and mitigate the spread of the virus.

## SCOPE OF THE PROJECT

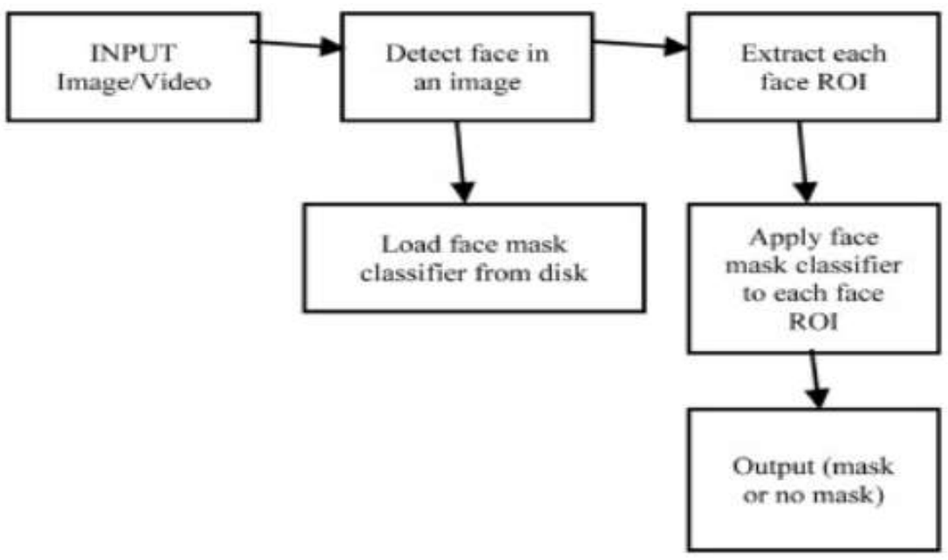
- Dataset Collection: Gather a diverse dataset of images or videos containing individuals with and without face masks. The dataset should include various scenarios, lighting conditions, angles, and different types of masks (cloth masks, surgical masks, N95 masks, etc.).
- Preprocessing: Preprocess the dataset by resizing images, normalizing pixel values, and applying any necessary transformations or enhancements to improve the quality and consistency of the data.
- Face Detection: Utilize OpenCV's face detection algorithms to identify and locate faces in the images or video frames. This step is crucial for isolating the regions of interest (ROI) for mask detection.

## METHODOLOGY

The methodology for a face mask detection project using OpenCV involves several key steps. First, a diverse dataset of images or videos with individuals wearing and not wearing face masks is collected. This dataset should encompass various scenarios, lighting conditions, angles, and mask types to ensure robustness. Next, the data is preprocessed, including resizing, normalization, and any necessary transformations to enhance the data quality.

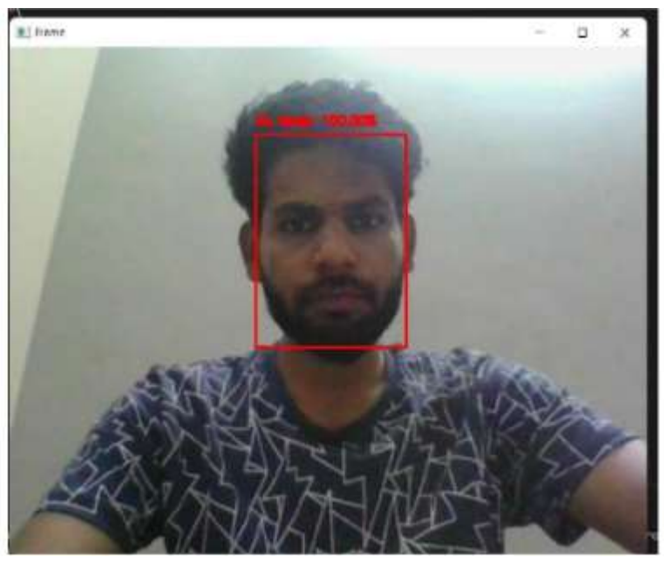
Face detection algorithms from OpenCV, such as Haar cascades or deep learning-based models like Dlib or OpenCV DNN, are employed to identify and locate faces within the images or video frames. This step enables the isolation of regions of interest (ROIs) for subsequent mask detection. Optionally, face alignment can be performed to standardize the pose or orientation of detected faces, improving accuracy.

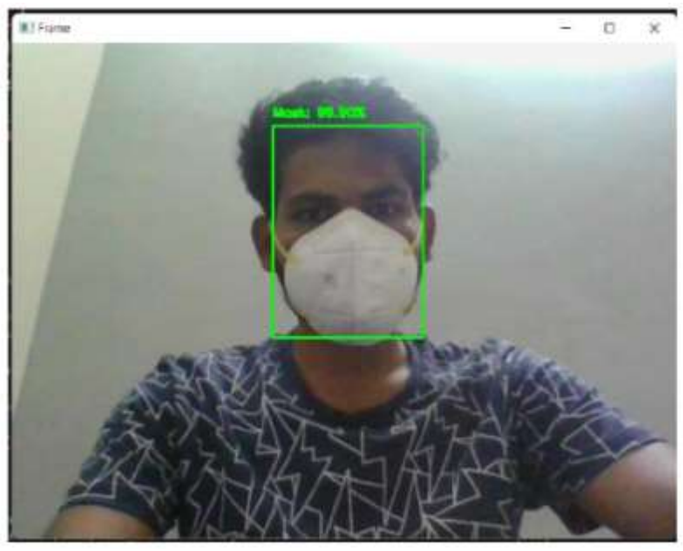
Once the model is trained, its performance is evaluated using appropriate metrics such as accuracy, precision, recall, and F1 score. Fine-tuning can be performed to enhance accuracy and robustness if necessary. The trained model is then implemented using OpenCV for real-time face mask detection on video streams or live camera feeds. Each face ROI is classified as "with mask" or "without mask," and bounding boxes are drawn accordingly.




## RESULTS

The result of a face mask detection system implemented using OpenCV would be a real-time solution capable of accurately identifying individuals wearing or not wearing face masks. The system would process video streams or live camera feeds, detecting faces within the frames using OpenCV's face detection algorithms. It would then classify each detected face as either "with mask" or "without mask" based on a trained machine learning or deep learning model. IOT BASED SMART PARKING SYSTEM





## CONCLUSION

With COVID cases are on the rise instances throughout the world, A system for swapping employees to examine masks on people's faces is critical. This strategy may be employed in public venues such as train stations and shopping malls. This method will be beneficial since it is simple to obtain and save information about the employees working in this company, and it is really simple to identify those who aren't wearing masks, and a message will be issued to each individual to request Precautions not wearing masks. Face masks have lately been mandatory in more than fifty nations throughout the world. In public places such as supermarkets, public transportation, workplaces, and businesses, people must conceal their faces.

## REFERENCES

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