



# Real Time Face Mask & Social Distance Detector

*Ayaan Dhotekar, Mahima Patil, Yashaswi Urade*

*Department of Computer Engineering*

*Sinhgad Academy of Engineering*

[ayaandhotekar7@gmail.com](mailto:ayaandhotekar7@gmail.com)

[mahimapatil54@gmail.com](mailto:mahimapatil54@gmail.com)

[chhakuliurade@gmail.com](mailto:chhakuliurade@gmail.com)

## ABSTRACT

COVID-19 has affected the world badly. Studies have demonstrated that wearing a facial covering is one of the insurances to diminish the danger of viral transmission. And many public places as well as public service providers require customers to use the service and place only if they wear mask correctly. Sometime it may not be easy to manually track the customer, whether they are wearing the mask or not. That's why this technology holds the key here. In this system, we propose face mask detection using image processing which is one of the high-accuracy and efficient face mask detector. This proposed system is of three stages i.e. 1. Image preprocessing 2. Face detection and crop 3. Face mask classifier. Our system is capable of detecting masked and unmasked faces and can be integrated with cameras and other hand detecting the distance between two people whether they are maintain distance or not .

**Keywords:** - Covid\_19, Image Processing, Mask, CNN.

## 1. INTRODUCTION

In Wuhan, China at the end of 2019 Corona Virus was detected. From that time, it has been spreading like a wild

fire in a forest area. Millions have been affected and around 1,799,505 have unfortunately passed away as on 30th of December 2020, almost a year since this virus came to existence. People who have this illness can take up to 2 weeks to cure, with the risk of having to suffer additional medical problems caused by it. Kids and elderly folks individuals have ended up being at the most elevated danger to get the infection, which might even bring about death. Subsequently, it has been focused on to contain the infection than to fix it. The infection spreads through the air, communicated by one individual to another by contact, yet additionally by talking and hacking. The worry was advanced to WHO (World Health Organization) which recommended that facial coverings and social removing is the response to it, until a fix is created. Putting a facial covering on can diminish the danger of getting tainted by an extraordinary degree, not exclusively to the one wearing it yet additionally to the others that he interacts with. Wearing veils each time we go out is something we can do with little exertion that can adequately save lives, and that is definitively why it is in such a lot of interest now of time. Hence we have proposed a system with two modules i.e. Face mask and social distancing

## 2. RELATED WORK

Sahana Srinivasan et.al [1] gives a similar investigation of various face recognition and facial covering order models. At long last, a video dataset naming technique is proposed alongside the named video dataset to make up for the absence of dataset locally and is utilized for assessment of the framework. The framework execution is assessed as far as exactness, F1 score just as the expectation time, which must be low for pragmatic relevance. The framework performs with a precision of 91.2% and F1 score of 90.79% on the marked video dataset and has a normal expectation season of 7.12 seconds for 78 casings of a video.

In [2] proposed a framework where For assessment of the prepared model, MAP (Mean Average Precision) was determined for both the utilization cases (Social Distancing and Face Mask Detection), it works by contrasting the ground-truth jumping box versus the distinguished box and, eventually, returns the score. The higher the MAP score would be, the better model is in the location of articles. Mean Average Precision was determined for two unique limits (0.25 % and 0.50 %) with 101 review focuses. Three distinct classes were made for grouping those were Good, Bad and None, for which True Positive and False Positive qualities were determined with ROC Curve for better arrangement.

In [3] reviews different profound learning organizations to foster such identifiers. In this review, the current article discovery models utilized for reconnaissance and individuals recognition are investigated. The one-stage and two-stage finders alongside their applications and execution are laid out in a complete way. Profound Learning models like AdaBoost, Viola-Jones, variations of CNN including ResNet, VGG-16, single-shot finders MobileNet, and forms of YOLO are examined and analyzed.

In[4] framework centers around an answer for assist with authorizing appropriate social removing and wearing covers out in the open utilizing YOLO object discovery on video film and pictures continuously. The trial results displayed in the paper derive that the identification of concealed appearances and human subjects dependent on YOLO has more grounded vigor and quicker recognition speed when

contrasted with its rivals. Their proposed object location model accomplished a mean normal accuracy score of 94.75% with a derivation speed of 38 FPS on record.

In [5] proposed a framework where they have gone to one of the lengths used to forestall COVID-19 spread and planned to foster a profound learning model to arrange individuals with or without a veil at public places like schools, universities, and corporates. Created calculation utilizing ideas of profound exchange learning and adjusting. The framework created on the MobileNetv2 base model, the head of it was supplanted by the custom facial covering discovery calculation and empowered the preparation of face veiled and non-face concealed pictures. The testing results have shown a precision of 98% on the two classifications with veil and without cover.

## 3. OBJECTIVES OF SYSTEM

- To prevent the spread of Corona virus by promoting the use of face masks with the help of effective technology to detect the face mask.
- To take necessary precautions for the safety of society by predicting the future outbreaks of COVID-19.
- To ensure a safe working environment.
- To save the lives of people.

## 4. MOTIVATION

Our main motive, Face mask detection with Social Distancing is the task of identifying an already detected object as that person wear mask or not and they are walking with maintaining Social Distance to each other.

## 5. SYSTEM ARCHITECTURE

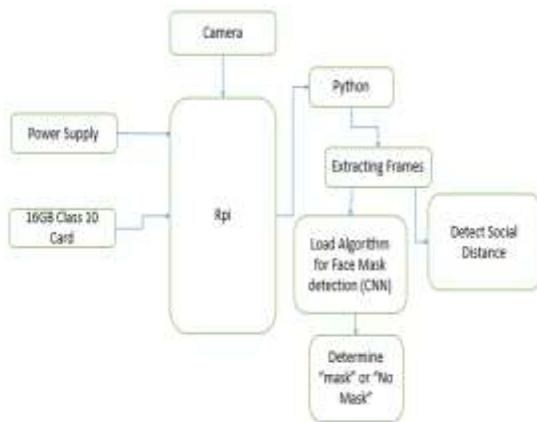


Fig: - System Architecture

## 6. METHODOLOGY

We are developing the project for detecting whether person is wearing a mask or not and even for measuring the temperature of person. This system focuses on how to identify a person wearing a mask on image or video stream with the help of Deep Learning and Machine Learning using Keras, TensorFlow, OpenCV and the Scikit-Learn library. We have used proposed architecture which is an accurate and efficient and can be applied to embedded device.

For the determination the model designed calculates ROI (Region of Interest), and later on compute bounding box value for a particular face and ensure that the box falls within the boundaries. The "Green" color box will be for with mask and "Red" color box will be for without mask. Once all detection is executed we will display the output. As well same will be for social distancing detector module. Alert is been generated accordingly.

## 7. ACKNOWLEDGEMENT

**We wish to thank to S.N.Shelke, Sinhgad Academy of Engineering, Pune, Maharashtra, India for the constant support and encouragement in our work.**

## 8. CONCLUSION

In this pandemic situation, where all people in countries are dreaming to get back to normal routine, this system will play effective role in monitoring the use of face masks at workplaces. As the technology are blooming with emerging trends the availability so we have novel face mask detector which can possibly contribute to public healthcare. With the increase and blooming technology and emerging trends in techniques. We have proposed as small system i.e novel face mask detector which can possibly contribute to public healthcare. We are using OpenCV, tensor flow, keras and algorithm to detect whether people were wearing face masks or not. By the development of face mask detection we can detect if the person is wearing a face mask and even the social distancing where we are calculating the distance and detecting whether the person is following the social distancing or not.

## REFERENCES

1. Sahana Srinivasan and Ruchita R Biradar, "COVID-19 Monitoring System using Social Distancing and Face Mask Detection on Surveillance video datasets", IEEE 2021
2. Yash Indulkar, "Alleviation of COVID by means of Social Distancing & Face Mask Detection Using YOLO V4", IEEE 2021
3. S. Vijaya Shetty and Pooja S, "Social Distancing and Face Mask Detection using Deep Learning Models: A Survey", IEEE 2021
4. Krishna Bhambani and Tanmay Jain, "Real-time Face Mask and Social Distancing Violation Detection System using YOLO", IEEE 2020
5. Mayank Dev and Rajiv Dey, "Face Mask Detector using Deep Transfer Learning and Fine-Tuning", IEEE 2021
6. Jiayan Ma and Jaideep Chakladar, "Using machine learning of clinical data to diagnose COVID-19: a systematic review and meta-analysis", Research Article 2020
7. Krishna Kumar and Narendra Kumar, "COVID-19 Epidemic Analysis using Machine Learning and

- Deep Learning Algorithms ”,Journal 2020
8. Alzubaidi MA and Banihani R,“An IoT-based Framework for Early Identification and Monitoring of COVID-19 Cases ”, Journal Pre-proof, 2020
  9. Nadeem Ahmed and Wanli Xue , “A Survey of COVID-19 Contact Tracing Apps ”,IEEE Access,2020
  10. Ravi Pratap Singh and Mohd Javaid, “Internet of things (IoT) applications to fight against COVID-19 Pandemic ”,2020
  11. Michael. J. Horry and Subrata Chakraborty, “Role of IoT to avoid spreading of COVID-19”, International Journal of Intelligent Networks,2020

