



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 6, June 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.542



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

Framework to Detect Face Masked Using Deep Learning

Yash Agrawal, Diksha Nitaware, Gauri Kulkarni, Saurabh Patil, Prof. Archana Lomte

UG Student, Dept. of Computer Science, BSIOTR, JSPM, Pune University, Wagholi, Pune, Maharashtra, India

Assistant Professor, Dept. of Computer Science, BSIOTR, JSPM, Pune University, Wagholi, Pune, Maharashtra, India

ABSTRACT: Covid19 has given another personality for wearing a veil. It is significant when these covered countenances are recognized precisely and proficiently. As an exceptional face recognition task, face veil identification is substantially more troublesome on account of outrageous impediments which prompt the deficiency of face subtleties. Furthermore, there is basically no current enormous scope precisely marked concealed face dataset, which increments the trouble of face veil discovery. The framework urges to utilize CNN-based profound learning calculations which have done tremendous advancement towards explores in face identification. In this paper, propose a novel CNN-based technique that is shaped by three convolutional neural organizations to recognize the face veil. Plus, in view of the deficiency of face veiled preparing tests, propose another dataset called "face cover dataset" to tweak CNN models. Assess proposed face veil recognition calculation on the face cover testing set, and it accomplishes agreeable execution.

KEYWORDS: Face Mask, CNN, Face Detection, Deep Learning.

I. INTRODUCTION

Towards the finish of this decade, the face has another distinguishing proof because of ascend in COVID-19 cases. Coronavirus is an infection that gets exacted when a tainted individual interacts with some other individual. A contaminated individual can leave hints of infection on things around them. His spit or contact is seen to be the most irresistible medium to convey this infection. Subsequently, a method of insurance individuals all around need to wear face cover to forestall themselves and everybody around them to get tainted by the VIRUS. This control has been made necessary which is helping in checking the COVID-19 cases. The government has used severe laws for wearing veils when around there. Individuals are fined for not wearing cover or not wearing it appropriately. Remembering the need for the time have proposed a technique for distinguishing the cover on the face.

The paper proposes a stage savvy strategy to identify the square of the face in pictures and observation recordings. The following stage includes the identification of the veil on this square. Further advances include if the cover is worn appropriately. The initial step of face identification is one of the longest-explored PC vision issues, which can be followed back about 50 years prior. In any case, the majority of the early face recognition calculations can't meet the functional need. The Viola-Jones as a first specialist for face discovery has a face identifier that comprises a progression of classifiers going from easy to complex ones. Later scientists kept on considering it dependent on it, and large numbers of them apply more perplexing and spellbinding highlights to make the identifier all the more impressive.

As of late, profound learning has made extraordinary forward leaps in numerous PC vision zones, for example, general item discovery, object order, object division, and obviously, face identification. Profound learning doesn't have to physically configuration highlights, as the CNN (Convolutional Neural Networks) can consequently take taking invaluable highlights from the preparation pictures. The proposed framework includes utilization of CNN for face location and discovery of veil at a later stage with K-implies. The framework will help distinguish individuals wearing veil also individuals not wearing cover or individuals who have not worn veil as expected. This is course will assist with carrying control to the public also insurance through which they can without much of a stretch wander around with cover out in the open spot and help check the COVID-19 contamination.

II. LITERATURE SURVEY

2.1 Multi-scale feature extraction for single face recognition.

The Single example face acknowledgment has consistently been a hot yet troublesome issue in face acknowledgment. By considering choosing hearty highlights and creating virtual examples all the while, the paper proposes a multi-scale support vector change (MSSVT) based technique to produce multi-scale virtual examples for single picture acknowledgment. The strategies to take care of issue are separated into two classifications. One is to search for and select highlights that are powerful to the quantity of tests, according to the perspective of highlight choice, like PCA and 2DPCA. However, when every individual has just one face to be prepared, the component data separated from the element extraction calculation will likewise be exceptionally restricted, bringing about an awful acknowledgment execution. The other is to create numerous virtual examples according to the perspective of the all-encompassing example, along these lines lessening the effect of the example size. [3]

2.2 Face recognition method based on sparse representation and feature fusion.

The creators propose a multi-highlight combination face acknowledgment strategy dependent on meagre portrayal. The centre's thought is to discover the inadequacy through preparing, and afterward utilize the inadequate coefficient and preparing tests to address the test tests, and afterward, the ideal scanty arrangement is acquired by tackling the 11-standard issue. The acknowledgment consequences of the highlight combination technique are superior to any single component calculation under the state of non-impediment or impediment. When there are under 10 photos of every class of individuals in the preparation test and the impediment type isn't controllable, calculation can in any case acquire a high acknowledgment rate. [5]

2.3 Spatial pyramid pooling in deep convolutional networks for visual recognition.

For Visual Recognition, Scales, Sizes, and Aspect Ratios are considered significant factors. SPP (Spatial Pyramid Pooling) is an adaptable answer for dealing with these components. In the setting of profound organizations, these elements have gotten less thought, accordingly, the framework is prepared with profound layer networks considering the SPP layer. SPP-net shows extraordinary exactness in arrangement/recognition assignments and enormously speeds up DNN-based identification. Their investigations additionally show that many time-demonstrated procedures/experiences in PC vision can in any case assume significant parts in profound organizations-based acknowledgment. [1]

2.4 Face and Gender Recognition System Based on Convolutional Neural networks.

The proposed Face and Gender Recognition System understands the mix of picture face acknowledgment and sexual orientation acknowledgment module, which empowers face acknowledgment as well as gender acknowledgment in a complex foundation. In light of the ResNet50 neural organizations, utilize the worldwide normal pool (GAP) rather than the completely associated layer before conclusive yield, trailed by the softmax layer, which diminished the size of the organizations. By developing a particularly basic construction, the precision of the framework acknowledgment has been improved. [6]

2.5 Dynamic Feature Matching on Partial Face Recognition.

In The halfway face acknowledgment is having application in an expansive range of various fields. The various methodologies utilized for the incomplete face acknowledgment are the central issue-based methodology, district-based methodology, and CNN-based methodology. In key point-based, the well-known strategy was MKD-SRC. In the locale-based halfway face acknowledgment approach, the noticeable model is MR-CNN. Amidst various methodologies in halfway face acknowledgment, it is inferred that the CNN-based methodologies are the nearly best methodology. The current novel methodology proposed for incomplete face acknowledgment. In CNN-based is called Dynamic Feature Matching (DFM). The unique component word reference connecting to the test is accomplished. DFM can yield the upsides of the properties of FCN and produce recognizing highlights all the more exactly. DFM is having a promising application in different video acknowledgment approaches later on. [2]

2.6 Implementation of Principal Component Analysis on Masked and Non-masked Face Recognition.

The paper examinations non-concealed face acknowledgment and covered face acknowledgment precision utilizing Principal Component Analysis (PCA) to perceive an individual. It demonstrated that a face without cover gives a better acknowledgment rate in PCA based face acknowledgment framework. In any case, when an individual is wearing a

cover, facial acknowledgment gives a helpless acknowledgment rate. It is discovered that extricating highlight from a veiled face is not exactly a non-covered face. In view of missing highlights for wearing a veil which declines the acknowledgment rate. At last, it is inferred that customary factual calculation Principal Component Analysis (PCA) is better for typical face acknowledgment however not for covered face acknowledgment. Thus, later on, worry to improve the precision of covered face acknowledgment utilizing other complex AI strategies. [7]

III. PROPOSED METHODOLOGY AND ALGORITHM

Description:

1 Image Capture

- Image is captured through Image itself or Video Input. These Images takes in inputs, which are then processed in hidden layers of network using weights that are adjusted during training.
- Then the model spits out a prediction. The weights are adjusted to find patterns in order to make better predictions.

2 Face Detection

- Face Detection. Locate one or more faces in the image and mark with a bounding box.
- Face Alignment. Normalize the face to be consistent with the database, such as geometry and photo metrics.
- Feature Extraction. Extract features from the face that can be used for the recognition task.
- Face Recognition. Perform matching of the face against one or more known faces in a prepared database.

3 Mask Detection

- Training: Here we'll focus on loading our face mask detection dataset from disk, training a model (using Keras/TensorFlow) on this dataset, and then serializing the face mask detector to disk.
- Deployment: Once the face mask detector is trained, we can then move on to loading the mask detector, performing face detection, and then classifying each face as with mask or without mask.

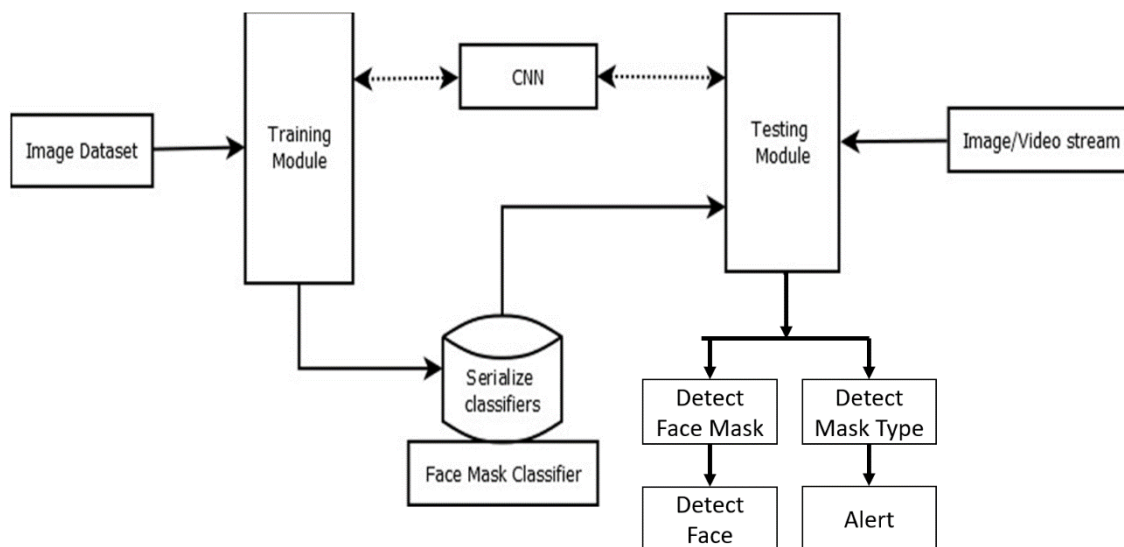


Fig 1 Proposed System

Algorithm: CNN (Convolution Neural network)

- Step 1: Dataset containing images along with reference caption is fed into the system.
- Step 2: The convolutional neural network is used an encoder which extracts image features ‘f’ pixel by pixel.
- Step 3: Matrix factorization is performed on the extracted pixels. The matrix is of m x n.

- Step 4: Max pooling is performed on this matrix where maximum value is selected and again fixed into matrix.
- Step 5: Normalization is performed where the every negative value is converted to zero.
- Step 6: To convert values to zero rectified linear units are used where each value is filtered and negative value is set to zero.
- Step 7: The hidden layers take the input values from the visible layers and assign the weights after calculating maximum probability.

IV. EXPERIMENTAL RESULTS

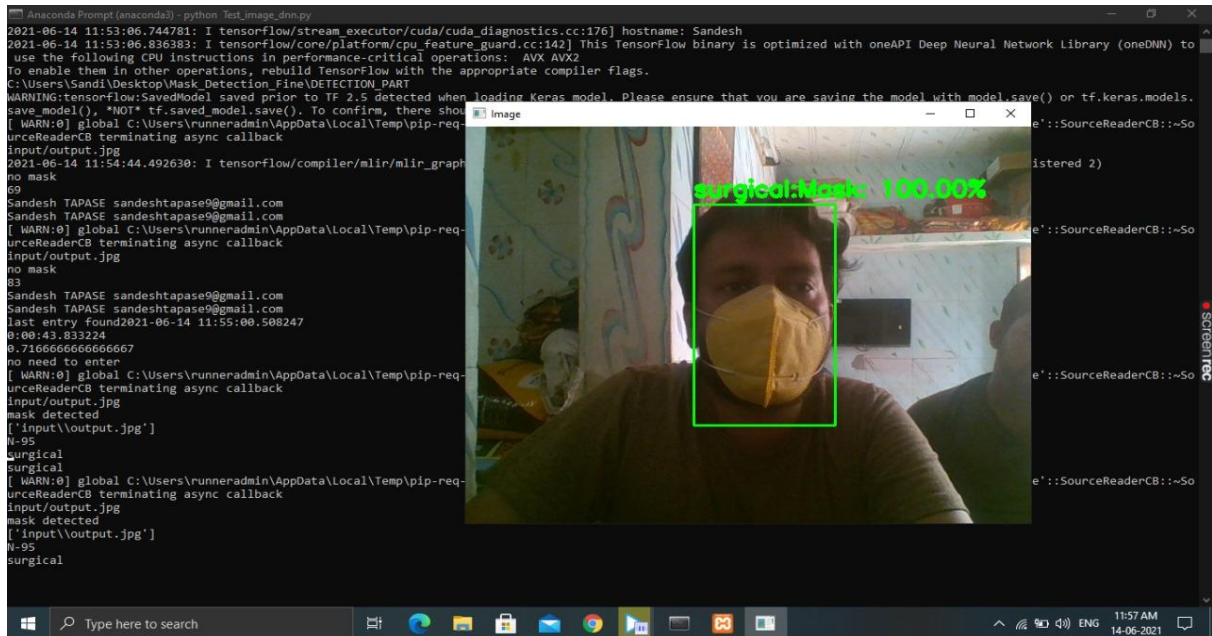


Fig.2 with Surgical Mask

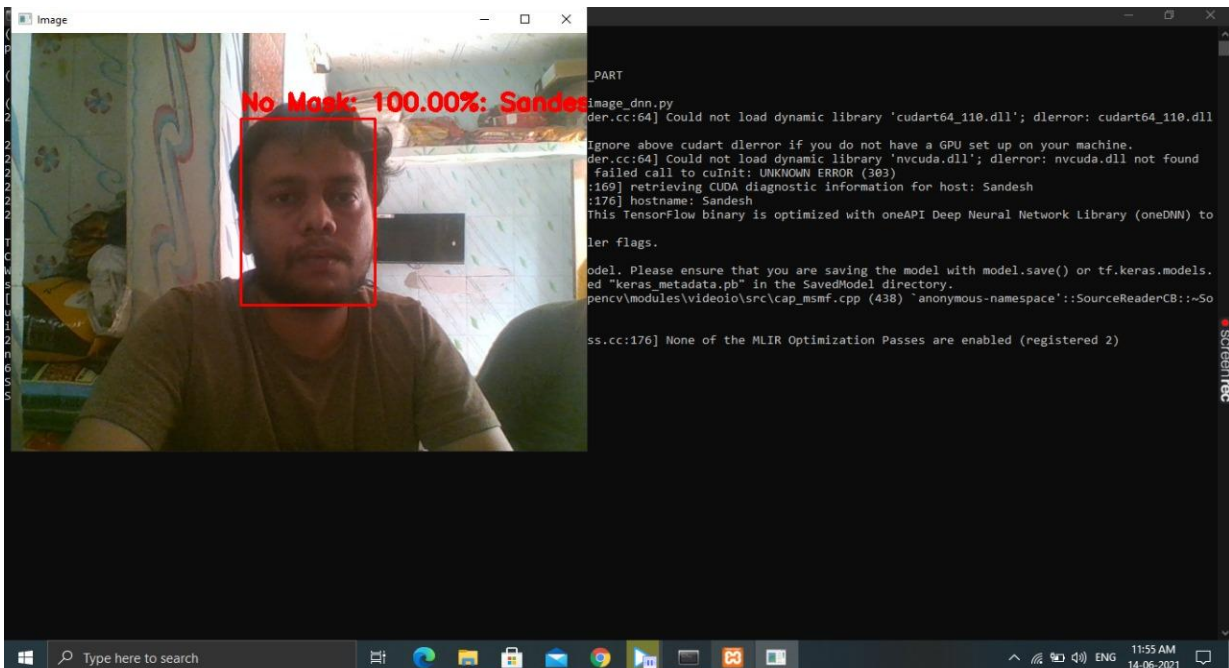


Fig.3 without Mask

V. CONCLUSION AND FUTURE SCOPE

Conclusion: The system is designed as most useful utility in recent times to detect themask on face. The cascade model study for face detection and further to identify the individual who are not wearing or who are not properly wearing the mask so that proper precaution and discipline can be utilized to stop the spread of virus. The individuals not wearing mask are notified while face detection is also implemented to know the individual.As a social cause this system can be implemented at malls as well at public places to curb spread of virus.

Future Scope: For future work, the same system can be utilized for face detection with maskwith different methods to analyse can be implemented for further identify more features on facial region.

REFERENCES

- [1] Kaiming He, Xiangyu Zhang, Shaoqing Ren, and Jian Sun. Spatial pyramid pooling in deep convolutional networks for visual recognition. In European Conference on Computer Vision, pages 346–361. Springer, 2014.
- [2] Wei Bu, Jiangjian Xiao, Chuanhong Zhou, Minmin Yang, Chengbin Peng A Cascade Framework for Masked Face Detection, IEEE 8th International Conference on CIS & RAM, Ningbo, China, 2017.
- [3] X. Xu, L. Zhang and F. Li, "MSSVT: Multi-scale feature extraction for single face recognition," 2018 24th International Conference on Pattern Recognition (ICPR), Beijing, 2018, pp. 1996-2001, doi: 10.1109/ICPR.2018.8545343.
- [4] Lun Zhang, Rufeng Chu, Shiming Xiang, Shengcai Liao, and Stan Z Li. Face detection based on multi-block lbp representation. In International Conference on Biometrics, pages 11–18. Springer, 2007.NaliniPriya G, Priyadarshani P, RajaRajeshwari K, IEEE 6thInternational Conference on smart structures and systems ICSSS 2019.
- [5] C. Jiang, M. Wang, X. Tang and R. Mao, "Face recognition method based on sparse representation and feature fusion," 2019 Chinese Automation Congress (CAC), Hangzhou, China, 2019, pp. 396-400, doi: 10.1109/CAC48633.2019.8997456.
- [6] Y. Zhou, H. Ni, F. Ren and X. Kang, "Face and Gender Recognition System Based on Convolutional Neural networks," 2019 IEEE International Conference on Mechatronics and Automation (ICMA), Tianjin, China, 2019, pp. 1091-1095, doi: 10.1109/ICMA.2019.8816192.
- [7] M. R. Reshma and B. Kannan, "Approaches on Partial Face Recognition: A Literature Review," 2019 3rd International Conference on Trends in Electronics and Informatics (ICOEI), Tirunelveli, India, 2019, pp. 538-544, doi: 10.1109/ICOEI.2019.8862783.
- [8] M. S. Ejaz, M. R. Islam, M. Sifatullah and A. Sarker, "Implementation of Principal Component Analysis on Masked and Non-masked Face Recognition," 2019 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT), Dhaka, Bangladesh, 2019, pp. 1-5, doi: 10.1109/ICASERT.2019.8934543."
- [9] E. Winarno, I. Husni Al Amin, H. Februariyanti, P. W. Adi, W. Hadikurniawati and M. T. Anwar, "Attendance System Based on Face Recognition System Using CNN-PCA Method and Real-time Camera," 2019 International Seminar on Research of Information Technology and Intelligent Systems (ISRITI), Yogyakarta, Indonesia, 2019, pp. 301-304, doi: 10.1109/ISRITI48646.2019.9034596.
- [10] S. Sawhney, K. Kacker, S. Jain, S. N. Singh and R. Garg, "Real-Time Smart Attendance System using Face Recognition Techniques," 2019 9th International Conference on Cloud Computing, Data Science & Engineering (Confluence), Noida, India, 2019, pp. 522-525, doi: 10.1109/CONFLUENCE.2019.8776934.
- [11] W. Zeng, Q. Meng and R. Li, "Design of Intelligent Classroom Attendance System Based on Face Recognition," 2019 IEEE 3rd Information Technology, Networking, Electronic and Automation Control Conference (ITNEC), Chengdu, China, 2019, pp. 611-615, doi: 10.1109/ITNEC.2019.8729496.



INNO  **SPACE**
SJIF Scientific Journal Impact Factor
Impact Factor: 7.542



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



www.ijircce.com

Scan to save the contact details