Detection of masked face While the COVID-19 Pandemic

Mrs. Vidhya k[1] Nayana D[2] Noor Fathima[3] Sandeep Gupta[4]

[1]*Assistant Professor* [234]*Student*
[1234]*Department of information Science and Engineering*
East West Institution of Technology, Visvesvaraya Technological University, Karnataka

ABSTRACT---The COVID-19 virus is spreading all over theworld.Doctors are recommended many precautionary measures to people to reduce the spread of corona virus where wearing a mask is compulsory which makes difficult to detect the masked face during the COVID-19 pandemic because certain parts of face are hidden. Wearing a mask keeps people safe during the pandemic is now giving thieves the perfect cover to thieves that means more crimes are being committed by people wearing face masks. Even Biometric based on password or fingerprint and any devices need to touch are not safer during Covid-19 pandemic. In this study, a reliable method is used to avoid crimes, community control, face authentication and recognition. There is a technical method for Detection of masked face recognition, which uses a pre-trained convolutional neural network(CNN) to capture the masked face image and separate into masked region and region of interest (mostly eyes and forehead region).

Keywords: Face Detection, COVID-19, Masked face, Deep learning, MLP, multilayer perceptron, CNN, Bag-of-futures paradigm

I. INTRODUCTION

Masked face has a profound impact on detection of masked face. According to the centers for disease control and prevention, COVID-19 is spread from person-to-person, usually through close contact and contaminated surfaces. Therefore, biometric password or fingerprint are not safer anymore.Researchers from NIST found that face masks are causing facial recognition algorithm to fail as 50% of the timeAccording to recent studies on COVID-19 virus, wearing a face mask by infected and non-infected people evidently transmission of this virus. Wearing a mask is compulsory which makes difficult to detect the masked face during the COVID-19 pandemic because certain parts of face are hidden. Faces provide the key information of personal identityand significant visual.Wearing a mask occurs different problems. Such as Fraudsters and thieves take advantage of the mask stealing and coming crimes without being identified.Face authentication andCommunity access control are become hard work when a grand part of the face is hidden by a mask. Existing face recognition methods aren't efficient when wearing a mask which cannot provide the entire face image for description. Exposing the nose region is extremely important within the task of face recognition since it is used for normalization, pose correction, and face matching. Due to these problems, face masks have significantly challenged existing face recognition methods. To overcome from these problems. For this purpose, we use detection of masked face while covid 19 virus in two different ways that are detection with and without masked face. Our project focuses mainly to detect or recognize the masked face. In our project image is captured and divided into two category: masked and without masked face. Face mask region is cropped and remove from the masked face.Cropped image is reached dimensions. With the help of convolutional neural network, image is reduced into a form which is easier to process. Pre-trained algorithms is applied to compare captured input with data set which is a collection of images. Convolutional neural network is used for better performance and high accuracy.

II. LITERATURE SURVEY

Researchers from NIST found that face masks are causing facial recognition algorithm to fail as 50% of the time Masked face has a profound impact on detection of masked face.In 2013,Identify face recognition, expression with better result and better performance with3D Face Recognition under Expressions, Occlusions, and Pose Variations but masked face is not recognized.In 2014, Face recognition is done easily using machine learning withRobust 3D face recognition in presence of pose and partial

occlusions or missing partsIt is not capable to do mask recognition but It is not capable to do mask recognition and it consumes more time. In 2020, Use of Neural Network gives the flexible of face recognition with A Novel GAN-Based Network for Unmasking of Masked Face but the accuracy is not accurate. In our project solves the above problems occurs by Experimental results on four widely used face data sets demonstrate that our method outperforms most existing state-of-the-art face recognition methods.

III. EXISTING SYSTEM

Face recognition is also a mode of authentication for mobile, biometric facial lock and face detection bythe surveillance cameras that failed due to faces being covered by face masks. Pre-trained convolutional neural network is used in our project which solves these problems by recognizing masked face. A convolutional neural network algorithm takes several images of 2 categories: mask and non-mask as input and passed through multiple layers that are input layer, hidden layer, output layer and provides better performance and efficient accuracy of face recognition from the data set.One consequence of our project is that facial recognition systems in place for security and crime prevention may no longer be able to fulfil their purpose.

IV. PROPOSED SYSTEM

This project based on the Neural Network, proposed the convolutional neural Network (CNN), it helps to process the multimedia process. In this method we collecting the several images of 2 categories = Mask and Non-Mask. we present in this paper an efficient quantization based pooling method for face recognition using VGG–16 pre-trained model. VGG-16 is nothing but a 16 layers of pre-trained model. A Convolutional Neural Network (ConvNet/CNN) could also be a Deep Learning algorithm which can absorb an input image, assign importance (learnable weights and biases) to varied aspects/objects within the image and be able to differentiate one from the other. While in primitive methods filters are hand-engineered, with enough training, ConvNets have the power to find out these filters/characteristics.

The architecture of a ConvNet is analogous thereto of the connectivity pattern of Neurons within the Human Brain and was inspired by the organization of the visual area. Individual neurons answer stimuli only during a restricted region of the field of vision referred to as the Receptive Field. A collection of such fields overlaps to hide the whole visual cortex
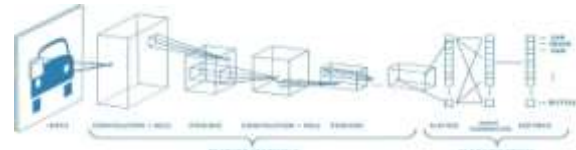
There are multiple layers embedded that are:
[1] Input layer
[2] Hidden layer
[3] Output layer.
Algorithm is applied for better image processing used Mobilenet version 2,this is a neighborhood of CNN algorithm and upgrade version of Mobilenet.
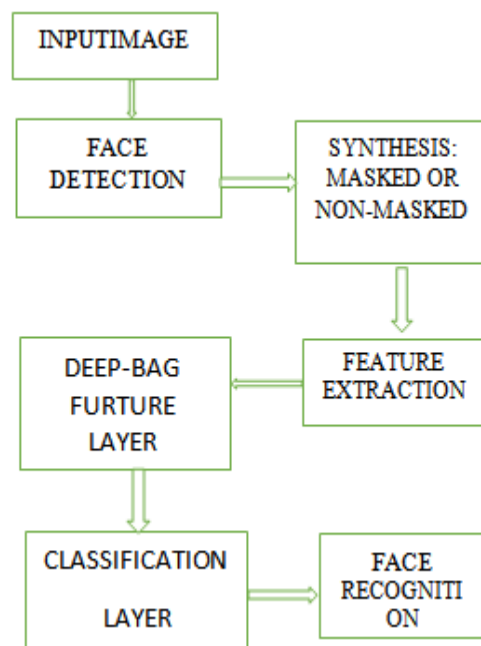
V. APPLICATION
commercial applications including identification, access control, forensics, and human-computer interactions.

VI. ADVANTAGES
-This system is designed to increased the level of security.
-This system is designed to reduce the complexity cost and model size of the network.
-This system is specially designed to recognize the masked face through surveillance cameras efficiently.
-high accuracy
-time saving
-faster process

VII. FUTURE SCOPE

Facial recognition market is predicted to garner $9.6 billion by 2022, registering a CAGR of 21.3% during the forecast period 2016-2022. face recognition could also be a biometric technology used for authentication and identification of individuals by comparing the countenance from an image with the stored facial database. it's expected to witness robust growth during the forecast period thanks to its increasing usage in both enforcement and non-law enforcement applications. Moreover, face recognition is widely preferred over other biometric technologies, like voice recognition, skin texture recognition, iris recognition, and fingerprint scanning, because of its non-contact process and easy deployment (using cameras and existing monitoring devices). Presently, this technology is extremely used for security, authentication and marketing purpose. as an example, billboards are designed with integrated software that are used to identify gender, age, and ethnicity to deliver targeted advertising.

VIII. CONCLUSION

In this paper, we studied the matter of masked face detection relevant within the scope of monitoring applications for the COVID-19 pandemic. We introduced a dataset for studying masked face detection problems and conducted an experimental study that looked at: (i) the performance of existing face detectors with masked-face images, (ii) the feasibility of recognition techniques aiming at the detection of properly worn masked-face in surveillance cameras Face recognition could also be a important role for biometric authentication system which attracts different applications like surveillance cameras and security, medical imaging.

REFERENCES

[1]. Loussaief and A. Abdelkarim. Deep learning vs. bag of features in machine learning for image classification. In 2018 International Conference on Advanced Systems and Electric Technologies (IC ASET), pages 6–10. IEEE, 2018.

[2]. Alyuz, B. Gokberk, and L. Akarun. 3-d face recognition under occlusion using masked projection. IEEE Transactions on Information Forensics and Security, 8(5):789–802, 2013

[3]. Website "Efficient Masked Face Recognition Method during the COVID-19 Pandemic". available: https://www.researchsqure.com

[4]. Duan, J. Lu, J. Feng, and J. Zhou. Topology preserving structural matching for automatic partial face recognition. IEEE Transactions on Information Forensics and Security, 13(7):1823–1837, 2018.

[5]. Website "Efficient Masked Face Recognition Method during the COVID-19 Pandemic" Avilable: https://www.arxiv.com

[6]. website" hoe to correctly detect face-masks for covid -19". Application: https://www.mdpi.com

[7]. website" issues face recognition and its application". Available: https://www.mdpi.com.

[8]. website " Face masks in the new covid-19 normal: material,testing"Available: https://spj.sciencemag.org