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Artificial Intelligence Based on Identifying Face Mask Wearing Detection Using Recurrent Neural Network

M. Nithya, R. Bharanidharan, M. Dinesh, V. Srinivasan

Abstract

COVID-19 has established a brand new frequency, and people have started realizing that they are entering a new world. The society is currently undergoing rapid change and needs to respond rapidly to fresh norms which surround us all. Creating a risk-free environment is a priority for everyone as life has not been as conductive as before brand new plans are methodized daily to adapt to policies and controls. The facial mask detection platform uses artificial intelligence see if the user is wearing a mask. App users can also add faces and phone numbers to warn themselves if they are not wearing a mask. A notice is issued to the administrator if the face captured by the camera is not recognized. Several COVID tracking tools are acceptable and safe in many aspects of the society. The most important tool is mask inspection using the proposed method, the artificial intelligence-based recurrent neural network (RNN) algorithm is enabled to capture the input image from the image classification in the dataset. However, in the overlapping scene, a different size and localization face mask detector provide a plurality of face images of the detected face. Detected faces extracted from this are grouped based on the human face detection. The recurrent neural network (RNN) algorithm using classifier and detection the mask or unmasked faces classifier. If the result is decoded from the stage, the final output is detected using all face images in the image correctly and then a message is sent to the surface and e-mail send that is not either of the mask or unmask.

Keywords: Artificial intelligence, Face mask detection, Mask detection, Recurrent neural network

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Introduction

The most important tool is mask inspection requirements these existing monitoring systems use the innovative neural network algorithm using artificial intelligence. After these guidelines, many countries have framed their own rules for wearing the mask to control the spread and some people have refused to comply with the government's regulations. The police are struggling to catch up the fraudsters, and they do not seem to be getting caught. Face detection and object detection are performed to identify the people who do not wear a mask, but some will help the police in controlling the people with computer vision problems. Face recognition, face detection technology, and artificial intelligence techniques are used to locate a specific object in an image and preprocessing is done to find which objects are in the image.

The face mask detection classification mark in the image the scale-invariant feature has been converted in this way. The feature vector between images is to compare matches to identify a patch. To generate the feature vector, some mathematical transformation need to be applied the architecture of this convolution allows people to extract the details of the even-numbered pixels faces detect the existing face in the face classification that can match it. A method has been proposed for generating an accurate segmentation mask from the input image of any size. Starting from any of the image sizes, this method uses the training weights system that has been pre-defined for the feature extraction. Full convolution through a network is trained to face in the image to the semantic segment. Gradient descent is used for training and is used as a binary cross-entropy loss function output image from the face mask is further processes the bounding box is to remove the unwanted noise around the face. It will be used to avoid a false prediction. In addition, the proposed model shows excellent performance in recognizing a non-frontal face. Therefore, it is possible to detect multiple masks in a single test to obtain the average pixel-level accuracy of the body data through multi-analysis set in the segmentation mask.

Department of Computer Science and Engineering, Vinayaka Mission's Kirupananda Variyar Engineering College, Vinayaka Missions Research Foundation (Deemed to be University), Salem, India.

Corresponding Author: M. Nithya, Professor and Head, Department of Computer Science and Engineering, Vinayaka Mission's Kirupananda Variyar Engineering College, Vinayaka Missions Research Foundation (Deemed to be University), Salem, India. E-mail: nithyam@vmkvec.edu.in

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Related Work

It is a convenient and effective measure of wearing a mask to suppress the spread at the source in most cases, people often use a mask in a short term.[1] It does not propose a detection system based on the mobile phone.[2] The extended feature's pyramid network module detects little faces to extend the range of the layer and adds the context receiving module network from the top of each feature head predicted. Under pathway architecture, the functionality and robustness of identification are to be improved.[3]

The recent COVID-19 issue wearing mask or unmask has failed to obtain a high result.[4] The area corresponding mask is to be used so that, the complicated operation is greatly simplified. One way is to promote the strengthening of the skin of a more flexible and accurate face. In beautification portrait, the edges save

operation and are smoothened, and lighting is broken down into layers of colors.[5]

In the movie, movie stars can confuse their identity with the help of forming a separate identity or silicone/latex mask. Such a realistic mask has been now readily available for entertainment purposes. However, even their criminal activities have been justified by the law enforcement agencies and automatic face recognition systems.[6] The purpose of demonstrating the detection of the attack is a difficult problem which is to expose the scammers to deceive the authentication system. In the face of the biometric authentication system, photo, including the true identity, video, or 3D bio-mask, has been used to carry out this attack.[7]

Face recognition and verification system are using the photograph. It is easy to cover spoofing attacks using video. Existing methods of digital technology are mostly being introduced in many electronic devices and systems; reliability fraud detection limit is enhanced using a manifold structure associated with focal identification and generalized functions in Euclidean space.[8] However, increase in the trackers functions so that the aggregate fits the kernel (the normal position and scale) of the spatial aggregation.[9] The face mask detection blocked containing system, which was more face mask detecting the classification of machine learning performance.[10]

Materials and Methods

Artificial intelligence for capturing an input image from the image classification of the dataset is based on the recurrent neural network (RNN) algorithm. Face mask detector detects a plurality of faces of different sizes localization. The detected face extracted from this stage (region of interest) is grouped. Recurrent neural network (RNN) algorithm will perform as mask classifier and detect the variance of data set. If the result is detected using all face images in the image correctly, then a message is sent to the surface and e-mail send that is not either of the mask or unmask.

Figure 1 shows the proposed recurrent neural network (RNN)-based face mask detection. If the results from the face images are detected correctly, the message is sent to the surface and e-mail that of the mask or unmask.

Image Capture

In the mask image, a number of pixel intensity values are zero and the other is non-zero in a simple image. Pixel intensity value is zero in the mask image and the mask image value is not an obtained value which is set as background. However, some mask images can only focus on our interests. Let us assume that a computer vision system is built to recognize faces.

Crop Face Image

To track the criminals and terrorists on the mask surface, accurate and effective detection of expropriation will be increasingly important. To hide our own face, detection task of face detection is more difficult, will lose the details of the face caused by extreme blockage. In addition, most of the existing large-scale methods, accurately labels masked surface dataset, adding to the difficulty of masking the face detection. Security is very important and image surveillance has become an active research theme. Image analysis, after the real-time event detection, improves the analysis by the image surveillance system.

Mask Detection Using Recurrent Neural Network

This deep learning based on artificial intelligence using person who is wearing a mask to keep wearing masks every day around the face of the record face of people have been put forward to draw a (red or green) bounding box. Face mask detection using proposed algorithm RNN using face mask that give an impressive performance face mask detection. Its performance is also a lot of masks to find a better result for the face mask detection.

Figure 2 shows that RNN architecture integrated by a limited number of a trained dataset and then their combined results significantly improve the dataset performance.

Algorithm Steps

Begin

For $s_{row} \leftarrow 1$

$d_1=0, d_2=0$

For $k_{col} \leftarrow 1$

$$P(f=n|b)=\varnothing_s(b)=\frac{d_o^2}{\sum_{t=1}^{t} d_t^2}$$

The face mask detection result

End for

End for

Stop

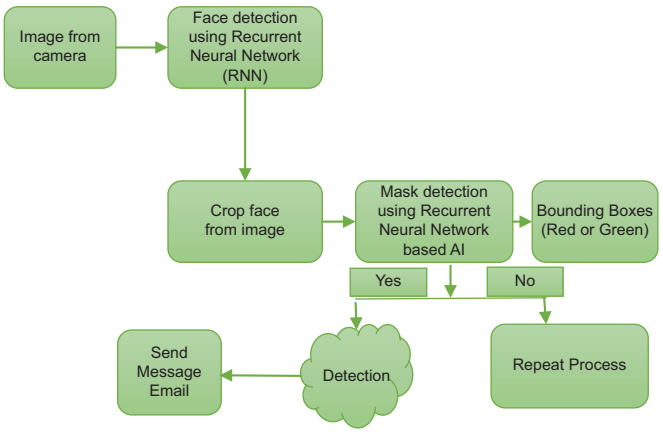

Figure 1: Proposed diagram

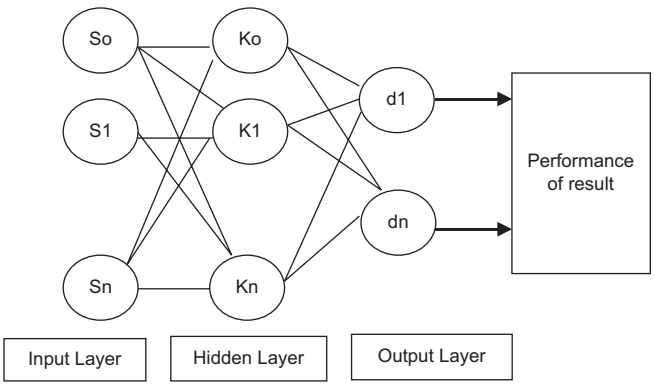

Figure 2: Architecture of recurrent neural network layers

Table 1: Simulation parameter tool

Simulation tool	*Parameter*
Using tool	Anaconda
Language	Python
RAM size	8Gb
Processor	Intel i5core

Table 2: Analysis of accuracy performance

No. of data	*ANN %*	*CNN %*	*RNN %*
10	44	48	75
20	49	55	80
30	50	59	82
40	54	62	95

Table 3: Analysis of prediction performance

Data	*ANN %*	*CNN %*	*RNN %*
10	44	52	65
20	46	55	70
30	49	59	80
40	50	63	93

Table 4: Analysis of time complexity performance

No. of data	*ANN %*	*CNN %*	*RNN %*
10	50	45	35
20	46	48	30
30	40	42	25
40	39	35	20

Detection Send Message E-mail

A common requirement for video security analysis is the presence of mask automatically detected. Using four different cameras are recommended for eyeliner detection, face detection section, disguise facial detection, and face mask detection distance estimate it outlines the principles used in a common algorithm for each step and human detection and face detection. This unique approach to this problem creates a simple feasible way. The algorithm RNN provides useful insights for the performance analysis of the test image to improve the performance of the masked face detection.

Results and Discussion

A recurrent neural network (RNN) based to mask the classification mask detected using the proposed method then send the alert e-mail to detect all faces correctly in the image and transmit either the mask or messages, such as that unmasked surface is an image.

Table 1 shows that simulation parameter tool using tool anaconda and python language and then RAM size 8 Gb and processor Intel i5core.

Table 2 shows the analysis of accuracy level performance on the proposed algorithm recurrent neural network (RNN).

Figure 3 shows the analysis of accuracy performance in the proposed algorithm recurrent neural network (RNN). The existing system artificial neural network (ANN) provides 54%, and convolutional neural network (CNN) provides 62%, and then, the proposed algorithm recurrent neural network (RNN) provides 95% accuracy performance.

Table 3 shows the analysis of prediction level performance in the proposed algorithm recurrent neural network (RNN).

Figure 4 shows the analysis of prediction level performance in the proposed algorithm recurrent neural network (RNN). The existing system artificial neural network (ANN) produces 50%, and convolutional neural network (CNN) produces 63%, and then, the proposed algorithm recurrent neural network (RNN) produces the highest 93% prediction performance.

Table 4 shows the analysis of time complexity performance of the proposed algorithm recurrent neural network (RNN).

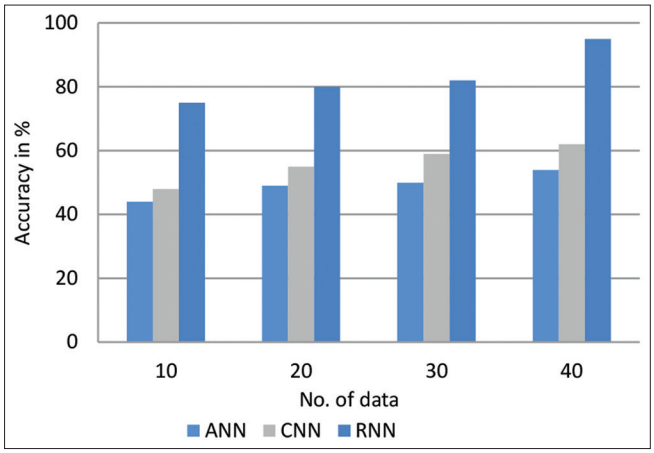

Figure 3: Analysis of accuracy performance

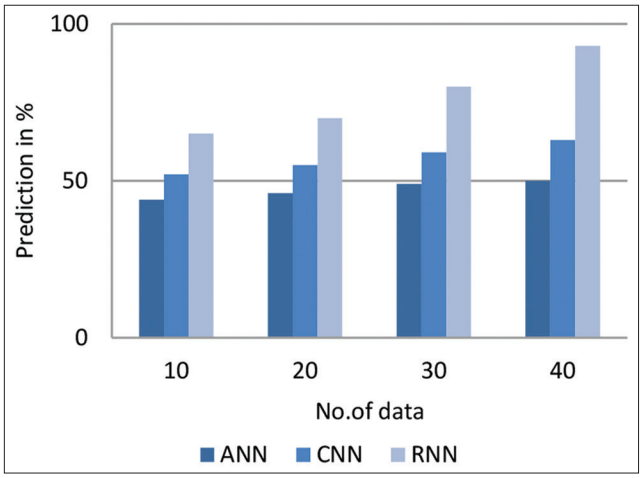

Figure 4: Analysis of prediction performance

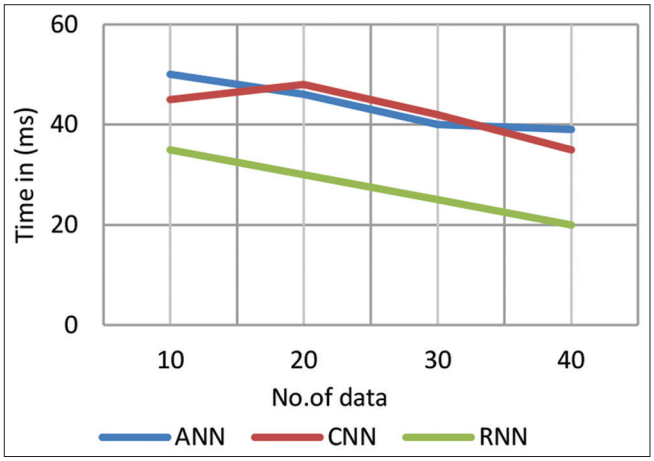

Figure 5: Analysis of time complexity

Figure 5 shows the time complexity performance of the proposed method recurrent neural network (RNN). The existing system artificial neural network (ANN) has 39 (ms) %, and convolutional neural network (CNN) has 35 (ms), and then, the proposed algorithm recurrent neural network (RNN) has the lowest 20 (ms) time performance.

Conclusion

Artificial intelligence-based recurrent neural network (RNN) algorithm has been implemented for face mask detection using the dataset image classification. Face mask detector detects a plurality of faces of different sizes localization and the wearable mask and non-wearable mask. Detected faces extracted from this stage region of interest are grouped based on the human face. The facial mask detection platform uses artificial neural networks to see if the user is wearing a mask. App users can also add faces and phone numbers to warn them if they are not wearing a mask a notice is sent to the administrator. Several COVID tracking tools are acceptable and safe in many aspects of the society. The proposed algorithm uses the recurrent neural network (RNN) face mask detection classifier then a message is sent to the surface and e-mail either of the mask or unmask. The proposed algorithm recurrent neural network (RNN) provides 90% accuracy performance, 93% prediction performance, and 20 (ms) time lowest performance.

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