Retraction

Retraction: Intelligent Mask Detection Using Deep Learning Techniques (J. Phys.: Conf. Ser. 1916 012072)

Published 23 February 2022

This article (and all articles in the proceedings volume relating to the same conference) has been retracted by IOP Publishing following an extensive investigation in line with the COPE guidelines. This investigation has uncovered evidence of systematic manipulation of the publication process and considerable citation manipulation.

IOP Publishing respectfully requests that readers consider all work within this volume potentially unreliable, as the volume has not been through a credible peer review process.

IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the Problematic Paper Screener [1] for bringing some of the above issues to our attention, prompting us to investigate further.

[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:2107.06751v1

Retraction published: 23 February 2022
Intelligent Mask Detection Using Deep Learning Techniques

P Anantha Prabha1, Karthikeyan G2, Kuttralanathan K1, Manoj Venkatesun M1
1Department of Computer Science and Engineering,
Sri Krishna College of Technology, Coimbatore, Tamilnadu, India
p.ananthaprabha@skct.edu.in, karthikk6734@gmail.com,
kuttral99@gmail.com, manoj.venkatesun@gmail.com

Abstract. Owing to the corona pandemic, the government has insisted on wearing a safety mask and maintaining 6 feet distance to get rid of Coronavirus. The detection of people with or without masks is a challenge due to the impact of Covid pandemic. There are some models / systems which really reduce the manpower to notify the people. The existing system runs on the model: Yolov3, VGG, for face detection and MobileNetv2 for face recognition, object detection, and semantic segmentation inorder to detect the people with and without masks. The proposed system holds an approach of detecting human’s faces and classifying them into people with and without masks which has been done using image processing and deep learning and our project runs under a model called Faster RCNN. Moreover, Faster R-CNN is more accurate while other models are faster. Being effective is not important but being efficient is way more important.

Keywords: coronavirus, pandemic, face mask detection and recognition

1. Introduction
The arena is struggling with Covid19 pandemic. There are such countless essential sorts of prevention expected to battle against Corona infection. One in every of such most fundamental is Face mask. Firststand fundamental face cover become now not obligatory for absolutely everyone but alternatively because the day advances researcher and medical doctors have prescribed anybody to put on face veil. currently To recognize if an character is carrying Face mask, we are able to make use of Face masks Detection method. Face masks Detection Platform makes use of artificial network to peer if a man or woman does/would not put on a cowl. The software can be related with any present day or new IP cameras to recognize people with/without a veil. in this weblog we will see several vast a part of face cover discovery for Covid19 cases in addition to for different normal cases. The sample of sporting face covers overtly is ascending because of the Coronavirus Covid pestilence everywhere on the arena. Previously Coronavirus, humans used to put on veils to at ease their wellbeing from air infection. Whilst others are unsure approximately their looks, they hide their feelings from human beings in popular by way of concealing their countenances. Researchers sealed that sporting face covers deals with blockading COVID-19 transmission.

2. Related Works
The situation report ninety six of global health affiliation (WHO) [1] introduced that Covid
infection 2019 (COVID-19) has tainted over 2.7 million individuals and induced more than 180,000 people. Likewise, there are some genuine respiratory illnesses, like extreme severe respiratory disease, which passed off within the previous couple of periods. [2-4] found out that the conception wide variety of Coronavirus is better contrasted with the SARS. [5] displayed that the cautious face covers should reduce impact on Covid 19. WHO suggests that people need to wear face covers at the outside area, if they have any respiratory symptoms, or they're dealing with some manifestations [6]. Viola Jones locator makes use of Haar encompass with vital photo strategy [7], whilst extraordinary works acquire various element extractors, like histogram of situated tendencies (HOG), scale-invariant detail exchange (SIFT), and so forth [8]. As of late, these object detecting models exhibit extra special execution and overwhelm the development of current object identifiers. One-level identifiers make use of a solitary neural agency to distinguish gadgets, consisting of single shot indicators (SSD) [9] and also you simply look as soon as (YOLO) [10]. YOLO separated the photograph into a few cells and in a while attempted to coordinate the anchor containers to objects for every cellular, but it is limited for little objects [11]. Single-shot Detector (SSD) conducts discovery on a few element courses to identify faces in diverse sizes [12]. To improve precision, [13] proposes RetinaNet with the aid of becoming a member of SSD and FPN engineering. MobileNet makes use of smart convolution to take away highlights to alternate channel numbers, so the computational cost of MobileNet decreases than networks making use of well-known convolutions.

3. Proposed System

In our project, it undergoes into two divisions: the first part focuses on grooming the face detection system based on the recognized human faces and detects face masks in the given bounded box area. The approach is by using Faster RCNN which is one of the architectures that uses Convolution Neural Networks (CNN). The other part of this project is to use a digital live recording camera at the entrance of any buildings to capture the photos of people visiting to work places or industries to improve their quality in order to detect an individual face who is not wearing masks and acts as an input parameter to the face mask detection system.

3.1. Proposed Architecture

Initially, we take two types of dataset into consideration in our project which is nothing but a Kaggle Dataset and Customised Dataset. Kaggle Dataset consists of 853 images belonging to the people who wore masks, wore masks incorrectly and without masks under 3 classes. Moreover, it’s been very much easier for annotating the dataset. Customised Dataset is nothing but a dataset which is randomly picked user images based upon various textures. Secondly, after preparing the dataset, labelling the images plays a major role. Under Labelling, the dataset is annotated by using the Labelling tool. Labelling tool is a graphical image annotation tool and it labels the objects inside bounding boxes in images Figure 1 and Figure 2.
Figure 1. Flowchart of face mask detection system

Figure 2. Annotated XML Dataset
3.1.1. Detection of face mask
This model is responsible for classifying the people based on wearing masks which plays a vital role in identification of a person without a face mask.

3.1.2. Detection of people without a mask
In this identification, we capture the faces, analyse properly in-order to get accurate results, and match the processed image with the stored database to retrieve the details of an individual who is not wearing the mask. Later on, with the integration of Twilio, it automatically sends and receives text messages to the respective people which intimates to wear a mask immediately. Twilio is nothing but a cloud based communication platform which automates those mentioned facilities with the help of web service APIs.

3.2. Transfer Learning
Transfer learning is a technique where a pre-trained file is reused for another model on another job. At first, train a network on a base dataset, then reuse extracted features or shift into another network to get trained on a required data. This process will be suitable to work if both features of base and target tasks, instead of particular to the core task Figure 3.

![Figure 3. Transfer Learning Architecture](image)

3.3. TensorFlow API
The object detector using Tensorflow API is used in creation of a neural network that helps in reducing the problems for item classification. It consists of pre-trained files named as model-zoo. It has a variety of pre-trained files tested on the various data. It can be useful for initializing our program when executing on the ideal data Figure 4.

![Figure 4. TensorFlow Object Detection Flowchart](image)
3.4. Faster RCNN
Faster RCNN is a neural network used for item classification, that shows as a sustained and fused network. It can predict the position of different items. Recently deep learning object classifiers such as Faster RCNN yield good results for item classification, it has good rate of success for identifying people, and earlier classifiers were using hybrid methods combined with hand-crafted and convolutional features Figure 5.

![Figure 5. Architecture of Faster RCNN](image)

4. Implementation
The proposed system’s implementation begins by detecting faces in a real time live recording as an input image. It is designed to predict the main coordinates on the face detected by using the boundary boxes method and extract the images from the recordings using OpenCV in Python. After the successful extraction of the images from the recordings, it gets passed to the trained Faster RCNN model which returns the classified label of predicted class. If the predicted class matches with the stored dataset then the respected individuals will get a notification through Twilio.

5. Experimental Results
The facial detection of the proposed system is implemented using OpenCV in Python programming language and TensorFlow Object Detection which is an Open-Source Face Detection method. The proposed face detection is evaluated under a normal lighting environment which ensures promising results Figure 6 and Figure 7.
6. Conclusion and Future Scope

Thus our proposed face mask detection is used by Deep Learning which reduces the processing data of humans by detecting the persons wearing face masks during this pandemic situation. It detects the persons not wearing masks and after recognising the person it sends an automated text message to the concerned people with the help of Twilio. The model that we created can be used in the places which holds the record of their entrants through CCTV cameras or also by running on computers to identify them in recorded data too. Currently it is only used in places where entrant data gets stored and in future it can be integrated with IOT kind of technology to prevent the entries without face masks.
References

[1] W. H. Organization et al., Coronavirus disease 2019 (covid-19): situation report, 96, 2020
[2] P. A. Rota, M. S. Oberste, S. S. Monroe, W. A. Nix, R. Campagnoli, J. P. Icenogle, S. Penaranda, B. Bankamp, K. Maher, M.-h. Chen et al., Characterization of a novel coronavirus associated with severe acute respiratory syndrome, science, vol. 300, no. 5624, pp. 1394–1399, 2003.
[3] Z. A. Memish, A. I. Zumla, R. F. Al-Hakeem, A. A. Al-Rabeeah, and G. M. Stephens, Family cluster of middle east respiratory syndrome coronavirus infections, New England Journal of Medicine, vol. 368, no. 26, pp. 2487–2494, 2013.
[4] Y. Liu, A. A. Gayle, A. Wilder-Smith, and J. Rocklöv, The reproductive number of covid-19 is higher compared to sars coronavirus, Journal of travel medicine, 2020.
[5] N. H. Leung, D. K. Chu, E. Y. Shiu, K.-H. Chan, J. J. McDevitt, B. J. Hau, H.-L. Yen, Y. Li, D. KM, J. Ip et al., Respiratory virus shedding in exhaled breath and efficacy of face masks.
[6] S. Feng, C. Shen, N. Xia, W. Song, M. Fan, and B. J. Cowling, Rational use of face masks in the covid-19 pandemic, The Lancet Respiratory Medicine, 2020.
[7] A. Haldorai and A. Ramu, Security and channel noise management in cognitive radio networks, Computers & Electrical Engineering, vol. 87, p. 106784, Oct. 2020. doi:10.1016/j.compeleceng.2020.106784
[8] A. Haldorai and A. Ramu, Canonical Correlation Analysis Based Hyper Basis Feedforward Neural Network Classification for Urban Sustainability, Neural Processing Letters, Aug. 2020. doi:10.1007/s11063-020-10327-3
[9] W. Liu, D. Anguelov, D. Erhan, C. Szegedy, S. Reed, C.-Y. Fu, and A. C. Berg, Ssd: Single shot multi-box detector, in European conference on computer vision. Springer, 2016, pp. 21–37.
[10] J. Redmon, S. Divvala, R. Girshick, and A. Farhadi, You only look once: Unified, real-time object detection, in Proceedings of the IEEE conference on computer vision and pattern recognition, 2016, pp. 779–788.
[11] W. Liu, D. Anguelov, D. Erhan, C. Szegedy, S. Reed, C.-Y. Fu, and A. C. Berg, Ssd: Single shot multi-box detector, in European conference on computer vision. Springer, 2016, pp. 21–37.
[12] J. Redmon, S. Divvala, R. Girshick, and A. Farhadi, You only look once: Unified, real-time object detection, in Proceedings of the IEEE conference on computer vision and pattern recognition, 2016, pp. 779–788.
[13] Jiangmiao Pang, Kai Chen, Jiaping Shi, Huajun Feng, Wanli Ouyang, Dahua Lin; Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2019, pp. 821-830.