Image Processing Based Smart Violation Detection in College

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ABSTRACT

According to statistics received via way of mans of the World Health Organization, the worldwide pandemic of COVID-19 has significantly impacted the arena and has now inflamed extra than 8 million humans worldwide. Wearing face mask and following secure social distancing are of the improved protection protocols want to be observed in public locations so one can save you the unfold of the virus. To create secure surroundings that contributes to public protection, we advocate a green laptop imaginative and prescient primarily based totally technique centered at the real-time automatic tracking of humans to locate each secure social distancing and face mask in public locations via way of means of imposing the version on raspberry pi4 to display hobby and locate violations via camera. After detection of breach, the raspberry pi4 sends alert sign to govern middle at kingdom police headquarters and additionally deliver alarm to public. In this proposed machine current deep gaining knowledge of set of rules had been combined with geometric strategies for constructing a strong modal which covers 3 factors of detection, tracking, and validation. Thus, the proposed machine favors the society via way of means of saving time and allows in reducing unfold of corona virus. It may be applied successfully in modern state of affairs while lockdown is eased to check out people in public gatherings, buying malls, etc. Automated inspection reduces manpower to check out the general public and additionally may be utilized in any place.

Keywords : Deep Learning, Vision, Convolutional Neural Networks (CNNs), Single Shot Detector, Transfer Learning, public Safety, Open-CV, COVID-19

I. INTRODUCTION

With the outbreak of COVID-19 virus and therefore the succeeding large-scale lockdowns across the world has given rise to associate degree mendacious situation. The start sectors may be a key pre-requisite for kick beginning economic activity of a nation. The protection of the work force in operation these plants can't be compromised.

Accordingly, processes are being place in situ to teach the workforce/College concerning new safety rules at the workplace/college that helps cut back the risk of virus transmission. However, to assist the workforce transition into a post COVID world, there was a desire for us to make solutions that help monitor and alert people once a security violation occurs. we tend to determine to make a system that takes in these feeds and analyses frames victimization deep learning models to find whether or not violations have occurred or not. At the side of this alert captured profaned image along with date and time is mail-clad that facilitates the authority analyses the trends and take appropriate actions to curb the violations.

In today's world, one of the most common problems people face to stay safe in crowded places is the escalation when COVID19 hits major cities around the world, forcing city residents to relocate to new places to adapt to regulations such as the use of masks. And wash your hands often with soap and water.

When we search online for COVID prevention measures/prevention, we will get a list of safety guidelines. A common reminder: "When you can't maintain physical/social distance, please wear a mask." Intelligence (AI) curbs the spread of COVID19 by promoting the use of masks and raising awareness. Maintaining social distance is an important tool to slow down the spread of infectious diseases. People are required to limit their interactions with each other to reduce the possibility of spreading diseases through physical or close contact.

II. RELATED WORK

In recent years, deep model object recognition technology may be more effective than surface models in solving complex problems, and remarkable progress has been made in computer vision.

Now it can be divided into two main families, two-stage detectors, such as RCNN, Fast RCNN and Faster R CNN and its variants, and stage detectors, such as YOLO and SSD. Using a two-stage detector, the detection is carried out in stages, the first stage calculates the recommendations, and the second stage classifies the object according to the category, and does not perform the detection. In the proposed system, we use the Multi-Box Disposable Detector (SSD), which seems to be a good choice for real-time object detection, but the compensation accuracy is also poor. SSD uses the previously trained Image-Net VGG16 model as the basic model to extract useful image functions. In addition to VGG16, SSD also adds several layers of convolution function, and the size is gradually reduced. Viola Jones' object recognition system can be taught to recognize any object, but this is especially common in face recognition. It is more accurate and faster. The Viola and Jones Process is an example of supervised learning. Another widely used facial recognition algorithm is Common. Detector, which is based on neural networks. This only applies to the leading edge and vertical edge. Lee et al. proposed another face recognition model: a multi-point face detector with navigation function. Oro et al. They also proposed a feature-based face detection algorithm similar to the GTX470 hair detection algorithm. There is no way to solve the problem of using only NVIDIA GPU computing components. According to Alto, Glass, and others, there will be imbalances when configuring workloads on the GPU. (2006) studied the importance of social differentiation and how to successfully maintain social distancing without using vaccines or antiviral drugs to gradually reduce the increasing pandemic risk; the author's research covers a wide range of rural and urban communities. Problem. Signs of slowing growth.

Z. Luo conducts research to find people with complete or partial disabilities. This method is classified by shape. People whose faces or objects are covered. This method is not suitable for our scene and

requires face recognition. External use: Put rags, wet tissues, paper towels and other masks in your mouth.
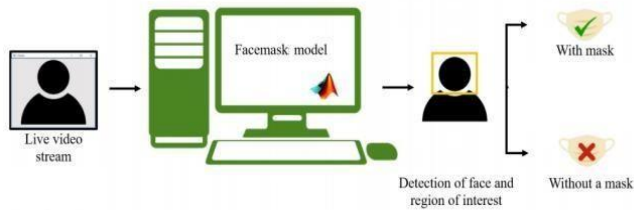
III. PROPOSED SYSTEM

Fig 2 : Live video stream is given as an input to the Facemask model

A. Problem Statement

Due to Covid-19 pandemic situation we can't even come in close contact with each other or can't even touch each other. Due to this situation school and colleges have been closed in order to avoid spread of covid19. So we are proposing a model which will detect the person maintaining the social distance and wearing a mask is also been checked at the gate.

B. Aim and Scope

To ensure the safety of the person enclosed in the build by block the infected people. Provide the information & analysis the captured image. Update the captured data through an SMS to concerned person.

C. Limitations

These six hypotheses have their limitations: First, a recent study showed that a virus was found in the outer layer of masks used by COVID-19 patients, which may offset the benefits of wearing masks; despite the virus, the masks still Preventive measures can be provided by reducing the viral load of healthy people nearby.

Other studies on asymptomatic mask wearers may be more convincing to confirm the effectiveness of wearing masks in preventing pre-symptomatic transmission. Second, we assume random combination and model the general population, but do not consider the role of children. Children are unlikely to wear masks often to understand the effectiveness of masks. At the same time, the role of children in the spread of COVID19 is unclear. Third, we assume that people who are willing to wear masks can use masks correctly and maintain social distancing and other personal hygiene habits. There is a difference between desire, expected fulfilment and actual fulfilment.

Fourth, research shows that if masks are not removed or replaced in time, masks may become a source of pollution.

IV. METHODOLOGY

We will use a cascaded hair classifier to implement our use case. Hair Cascade Classifier is an effective object detection technique proposed by Paul Viola and Michael Jones in their 2001 article "Using the extended cascade of extended simple functions for fast object detection". This is a method based on student machine learning. A large number of composite functions for positive and negative images. Then, based on training, it is used to identify objects in other images. It works like this: They are huge independent .xml files with many functions, and each XML corresponds to a very specific use case.

A. Cascade Object Detector

Object recognition is used to identify objects in pictures or videos. The toolbox of the computer vision system supports a variety of object recognition techniques, including pattern matching, point analysis, and Viola Jones algorithm. This area corresponds to the largest picture. Used to identify the attributes of the object of interest. The Viola-

Jones algorithm uses hair attributes and many classifiers to recognize previously trained objects, such as faces, noses, eyes, and other body parts. In addition, train your own classifier.

B. CNN

Convolutional Neural Network (CNN) is a multilayer neural network with a special architecture for defining complex data attributes. CNN has been used for image recognition, robotics, and vision enhancement for autonomous vehicles. It is used to classify images. After creation, it can be used to classify the content of multiple images. All we have to do is load these images into the model. Like ANN, CNN is inspired by the way the human brain works. CNN can classify images by recognizing features, just like the human brain recognizes objects by recognizing features. The image is composed of pixels. Each pixel is represented by a number between 0 and 255. Therefore, each image has a digital representation, which can be processed by a computer. Steps followed in the proposed methodology is as below.

1. Capture the image.
2. Identify the person from the image.
3. Recognize the faces wearing mask (Mask detection).
4. Social Distance.
5. SMS module.

This model is more reliable in providing security. This is also much anticipated solution to the problem of illegal or rules violation in any places and also it can be used to monitor social distance and also mask detection.

1. Interfacing of camera to capture live face images.
2. Monitoring the social distance and face mask detection.
3. If mask is not detected and not maintaining social distance then sending an alert about the violation to authorized person.

The following steps are followed for the unusual activity detection using CNN and the Image processing algorithms. The frontend is designed by tkinter software and backend by means of Tensor-Flow, Keras that is been castoff for stocking the prototypical.
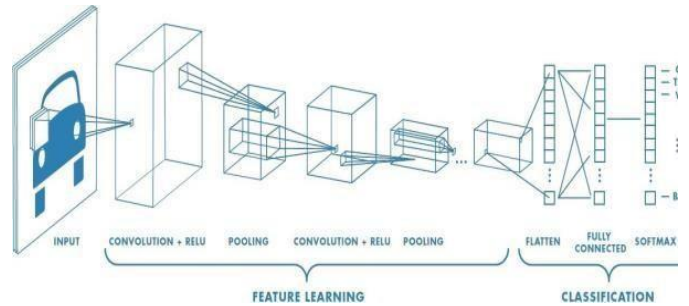

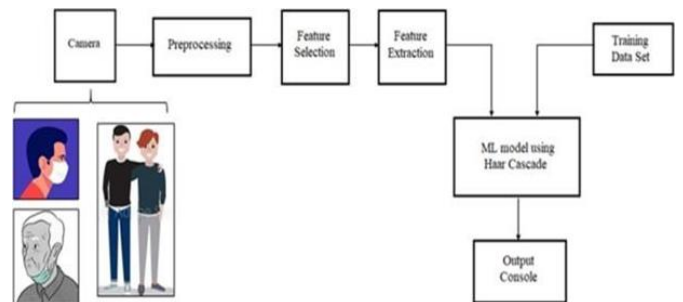Fig 3: Neural network with many convolutional layers

Fig 3: Proposed Face Mask Violation Detection Block Diagram
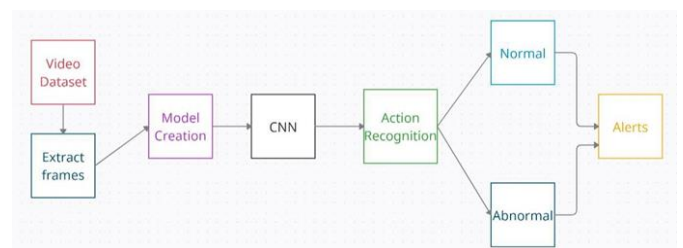

Fig 4: Proposed Unusual Activity detection Based on CNN

1. We train the CNN prototypical is castoff and associated to a new frontend sheet.
2. The front end user interface is generated using the users can interrelate with the conceptions and perceive the position in real-time.
3. The second screen is in which the image is gotten, examined and output is foreseen by spending CNN in the backend.

4. Once the image is examined, the scheme will exhibit the output by identifying the exploit whether the activity is abnormal or normal.

5. As soon as image is examined it drive also generate an alert by giving a sound to the operator rendering to the event noticed.

V. CONCLUSION

The model proposed was given a better results compared to the expected. Any number of persons in the real time images were captured and tested. The model was able to detect all the individual person mask absence with an immediate message were sent alerting the same. The model can be further updated with detection of violation with multi camera structure.

VI. ACKNOWLEDGMENT

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Cite this article as :