

Covid-19 Face Mask Detection Alert System

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Abstract: Most COVID-19 pandemic because of novel coronavirus is constantly spreading till now all around the world. The impact of COVID-19 has been fallen on nearly all sectors of development. The healthcare gadget goes via a crisis. Many precautionary measures were taken to lessen the unfold of this disorder wherein sporting a masks is one in all them. In this paper, we advocate a gadget that limitation the boom of COVID-19 with the aid of using locating out folks that aren't sporting any facial masks in a clever town community wherein all of the public locations are monitored with Closed-Circuit Television (CCTV) cameras. While someone with out a masks is detected, the corresponding authority is knowledgeable via the town community. A deep learning structure is skilled on a dataset that includes photographs of human beings with and with out mask accumulated from diverse sources. The skilled structure accomplished 98.7 Accuracy on distinguishing human beings with and with out a facial masks for formerly unseen check data. It is was hoping that our have a look at could be a beneficial device to lessen the unfold of this communicable disorder for many nations withinside the world.

KEYWORDS: Image Processing, Convolutional Neural Network, Data Classification, SMTP.



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1. INTRODUCTION

A new stress which has now no longer formerly been diagnosed in human beings is novel coronavirus (nCoV). Coronaviruses (CoV) are a huge institution of viruses which purpose infection that variety from colds to lethal infections like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) [1]. The first inflamed affected person of coronavirus has been discovered in December 2019. From that period, COVID-19 has end up a plague all around the international [2]. People all around the international are going through tough conditions because of this pandemic.

. Every day a massive wide variety of human beings are being inflamed and died. At the time of scripting this paper, nearly 16,207,130 inflamed instances had been showed in which 648,513 are death [3]. This wide variety is growing day with the aid of using day. Fever, dry cough, tiredness, diarrhea, lack of taste, and odor are the major signs of coronavirus which is said with the aid of using the World Health Organization (WHO) [4]. Many precautionary measures had been taken to combat in opposition to coronavirus. Among them cleansing hands, keeping a secure distance, carrying a masks, refraining from touching eyes, nose, and mouth are the main, in which carrying a masks is the most effective one. COVID-19 is a sickness that unfold from human to human which may be managed with the aid of using making sure right use of a facial masks. The unfold of COVID-19 may be restricted if human beings strictly preserve social distancing and use a facial masks. Very sadly, human beings aren't obeying those policies well which is dashing the unfold of this virus. Detecting the human beings now no longer obeying the policies and informing the corresponding authorities may be an answer in decreasing the unfold of coronavirus. A face masks detection is a way to discover whether a person is carrying a masks or now no longer. It is just like locate any item from a scene. Many structures had been added for item detection. Deep gaining knowledge of strategies are relatively used in clinical applications [5], [6]. Recently, deep gaining knowledge of architectures [7] have proven a superb function in item detection. Most ecommerce companies have their receive to pay process as predominantly manual, leading to non-reliability of payments &

delayed visibility for sellers and requirement of additional manpower for scaling up for buyers.

These architectures may be integrated in detecting the masks on a face. Moreover, a clever metropolis [8] way an urban location that includes many IoT sensors to gather records. These amassed records are then used to carry out distinct operations throughout the metropolis. This consists of tracking traffic, utilities, water deliver community, and lots of more. Recently, the growth of COVID-19 may be decreased with the aid of using detecting the facial masks in a clever metropolis community. This paper objectives at designing a device to discover whether someone is the use of a masks or now no longer and informing the corresponding authority in a clever metropolis community. Firstly, CCTV cameras are used to seize real-time video photos of distinct public locations within the metropolis.

II. RELATED WORK

Many systems have now been developed for COVID-19 in smart city networks. BlueDot and HealthMap services were introduced in [9]. The BlueDot method was first used to mark the unusual cluster of pneumonia in Wuhan that eventually discovered the disease as a pandemic. predicted the virus would spread from Wuhan to Bangkok, Taipei, Singapore, Tokyo and Hong Kong. San Francisco-based HealthMap service discovered patients with a cough, which is the first sign of COVID-19, and uses artificial intelligence (AI), and a study of the use of masks to limit the growth of COVID-19 is reported in [10] introduced. . The study showed that properly fitting masks were effective in disrupting droplet propagation. Expelled by coughing or sneezing. Masks that don't fit perfectly can also trap particles and viruses in the air. Allam and Jones [11] proposed a framework for smart city networks that focuses on how data should be exchanged during the COVID-19 outbreak. the perspectives of urban health data in relation to the security issues of the economy and The system collects data from various points in the city with sensors, trackers and from laboratories. Jiang et al. [12] The model contains a single-stage detector, which consists of a pyramidal network that leads to a slightly higher accuracy and recognition value than the initial result. To reduce the scarcity of data sets, they used transfer learning, a well-known deep learning technique. Gupta et al. [13] proposed a model to enforce

social distance using Smart City and the Intelligent Transportation System (ITS) during the COVID-19 pandemic. His model described the use of sensors in different places in the city for monitoring the real-time movement of objects and provided a platform for data exchange. Won Sonn and Lee explain a remarkable contribution of a smart city to controlling the spread of the coronavirus in South Korea

The continuous supply of vital materials and the contactless logistical distribution of systems to society paved the way to contain the spread of the coronavirus. Real-time map reflection systems and systems have been used to block vehicle movement during the pandemic. It was used to monitor city scenes

III. METHADODOLOGY

We proposed an automatic clever framework for screening individuals who aren't the usage of a face masks on this paper. In the clever city, all public locations are monitored through CCTV cameras.

The cameras are used to seize pictures from public locations; then those pictures are feed right into a machine that identifies if any man or woman with out face masks seems withinside the picture. If any man or woman with out a face masks is detected then this statistics is despatched to the right authority to take important actions.

All the blocks of the evolved machine are defined as follows. A. Image Preprocessing The pictures captured through the CCTV cameras required preprocessing earlier than going to the subsequent step. In the preprocessing step, the picture is converted right into a grayscale picture due to the fact the RGB shadeation picture carries so much redundant statistics that isn't important for face masks detection. RGB shadeation picture saved 24 bit for every pixel of the picture. On the opposite hand, the grayscale picture saved eight bit for every pixel and it contained enough statistics for type. Then, we reshaped the pictures into (64×64) form to hold uniformity of the enter pictures to the structure. Then, the pictures are normalized and after normalization, the fee of a pixel is living withinside the variety from 0 to 1. Normalization helped the studying set of rules to study quicker and captured important functions from the pictures. B. Deep Learning Architecture The deep studying structure learns numerous critical nonlinear functions from the given

samples. Then, this learned structure is used to are expecting formerly unseen samples.

To teach our deep studying structure, we amassed pictures from one-of-a-kind sources. The structure of the studying technique surprisingly relies upon on CNN. All the factors of deep studying structure are defined below. i) Dataset Collection: Data from one-of-a-kind sources [19], [20] are amassed for education and checking out the version. We amassed a complete of 858 pictures of humans with mask and 681 pictures of humans with out a masks.

For education purposes, 80% pictures of every magnificence are used and the relaxation of the pictures are applied for checking out purposes. Fig. 2 indicates a number of the pictures of one-of-a-kind classes. ii) Architecture Development: The studying version is primarily based totally on CNN which could be very beneficial for sample recognition from pictures [21]. The community contains an enter layer, numerous hidden layers and an output layer. The hidden layers encompass a couple of convolution layers that study appropriate filters for critical characteristic extraction from the given samples.

The functions extracted through CNN are utilized by a couple of dense neural networks for type purposes. The structure of the evolved community is illustrated in Table I. The structure carries 3 pairs of convolution layers every observed through one max pooling layer. This layer decreases the spatial length of the illustration and thereby reduces the range of parameters. As a result, the computation is simplified for the community. Then, a flatten layer reshapes the statistics right into a vector to feed into the dense community. Three pairs of dense and dropout layers study parameters for type. The dense layer contains a sequence of neurons every of them study nonlinear functions. The dropout layer prevents the community from overfitting through losing out units. Finally, a dense layer containing neurons distinguishes the classes.

IV. LIMITATIONS AND FUTURE WORKS

-The developed system faces troublesomeies in classifying faces lined by hands since it nearly appears like the person sporting a mask. whereas anyone while not a mask is traveling on any vehicle, the system

cannot find that person correctly. For a awfully densely inhabited area, distinctive the face of every person is extremely difficult.

For this sort of scenario, identifying individuals without face mask would be very difficult for our planned system. so as to induce the most effective result out of this system, the city should have an oversized variety of CCTV cameras to watch the full town yet as dedicated work force to enforce correct laws on the violators. Since the info regarding the violator is shipped via SMS, the system fails once there's a haul within the network.

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