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Predicting Spread of Omicron Variant by Face Recognition Embedded with Distance Measure Sensor Using Machine Learning Techniques

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Abstract: In a human life pandemic situations are occurred at different time intervals. In December 2019 pandemic is started due to Covid-19 corona virus, still virus is spreading by changing its structure, structure of virus is changed due to mutation with itself, Indian government approved few vaccines like Covisheild, Covaxin, Sputnik, and so on, these vaccines are useful to increase immunity power to reduce impact of virus, maintaining social distancing give better results control spread of virus. To educate people to maintain social distancing, we proposed a method to predicting spread of omicron covid-19 variant by face recognition embedded with distance measure sensor using machine learning techniques, and it is working in five phases. In first phase movements of employees are captured using drones and CC cameras, in phase two all captured images are send to distance measure sensor devices, in phase three check distances with threshold values and if not met send details to next phase, in phase four face recognition technique is used to identify ids of persons who are not maintaining social distance, and in phase five output is presented to end user. To control covid-19 virus proposed model is used to identify list of employees who are not following social distancing, same list is forwarded to heads, and well as concern employees.
Keywords: SARS_Cov2, Pandemic, Omicron variant, Machine Learning, Social Distance Detection, Face Recognition, Image processing

I. INTRODUCTION

In a human life pandemic situations are occurred at different intervals. List of pandemic situations arises in human life history, in 164-181 Antonine plague occurred and total mortality is around five million, in 730-740 Japanese plague and total mortality is around one million, from 1500 to present Smallpox occurred and total mortality is around 56 million, in 1600 London plague occurred and total mortality is around 100000, from 1626 to 1629 Italian Plague occurred, in 1810 to 1920 cholera pandemics and total mortality is more than 1 million, in 1984 third plague and total mortality is around 12 million, in 1801 yellow fever and total mortality is around 1.5 lakh, from 1888 to 1891 Russian flu and total mortality is around one million, from 1917 to 1920 Spanish flu and total mortality is around fifty million, from 1956 to 1959 Asian flu and total mortality is around 1.1 million, from 1967 to 1971 Hong Kong flu and total mortality is around 1 million, from 1980 to present AIDS and total mortality is around 34 million, from 2009 to present Swine flu and total mortality is around 2 lakh, from 2002 to 2003 SARS and total mortality is around 700, from 2013 to 2016 Ebola virus and total mortality is around ten thousand, from 2015 to present MERS and total mortality is around 800, from December 2019 to present SARS-CoV-2 and total mortality is around 54.2 lakhs, delta variant may 2021 to present and total mortality is around five million [16].

These kind of pandemic situations impact world economy in a short span of time. Pandemic situations directly increase medical expenses and indirectly impact on production of goods, and it is also impact on travelling cost, services, and many more. Number of researches has conducted on this issue and number of countries GDP is lost 3 to 4 percentage it will in turn lead to increase product supply and demand [15].

As per WHO recommendations, vaccinations of people will improve immunity power people and which is useful to fight with virus, but all these vaccine are not assure 100% to cure omicron covid-19 variant disease, WHO suggested few precautionary measures like frequent hand sanitization, wear face mask continuously, try to void gatherings, try to void journey, follow social distance, stay at home, and so on, all these measures are useful to predicting from omicron covid-19 variant. Covid-19 pandemic imposed health emergency and it will be continuing present with different variants [14].

IOT devices play vital role to detect spread of omicron corona variant to other people by detecting early stages, closely monitor employees movements in an organization, warn employees who are not following social distance, educate employees about virus spread, and counsel all employees about covid-19 protocols to be followed in an organization. In this research paper we are working on social distance measure embedded with face recognition to know how many are not maintaining social distancing, results are useful to educate them persons who are not maintaining social distancing, and also useful to take necessary actions on time to control spread of these kind of virus. In this research paper we mainly focus on spread of omicron corona variant due to not following social distance [13].

II. RELATED WORK

The first case of covid-19 is identified in Wuhan market on 8th December 2019. And it is a capital of Hubei of China. After that a group of peoples are identified with same disease symptoms in the same month. WHO identified Covid-19 in 7th January 2020, first death of covid-19 is reported on 11th January 2020, in Thailand Covid case is identified on 13th January 2020 which is first case outside China, first case of Covid-19 in USA identified on 21st January 2020, on 22nd January 2020 WHO declares that Covid-19 is spread from human to human [12]. First China made Wuhan and two more cities of China under complete lock down, all other countries are also declared lock down, impose big health emergency, on 09th February 2020 WHO declares that death in china occur due to Severe Acute Respiratory Syndrome (SARS) virus, on march 08th 2020 almost all Covid-19 cases spread to hundred countries and WHO announces pandemic on 11th March 2020 due to Covid-19 cases, on 2nd April 2020 Covid-19 cases reached to one million, on 15th April 2020 Covid-19 cases reached to two million, on 27th April 2020 Covid-19 cases reached to three million, 21st May 2020 Covid-19 cases reached to five million all over world, on 27th may 2020 USA Covid-19 cases death reached to one lakh, from December 2019 to present SARS-CoV-2 and total mortality is around 54.2 lakhs, delta variant may 2021 to present and total mortality is around five million [11].

Hardliner examples of consistence with general wellbeing measures are a component of early COVID-19 reactions. By and large, these distinctions in conduct connect with prior bunch personalities. Notwithstanding, in the midst of quick cultural change, novel assessment based gatherings can arise and give another premise to sectarian distinguishing proof and different aggregate conduct [1]. Here, they use network strategies to plan the rise of contradicting assessment based gatherings and survey their suggestions for general wellbeing conduct. In a longitudinal report, they tracked general wellbeing perspectives and self detailed conduct in an example of UK members throughout four time focuses. Network perceptions uncover a break in attitudinal arrangement over the long run and the beginning of two particular gatherings portrayed by trust, or doubt, in science. These gatherings additionally wander in general wellbeing conduct. In a brief follow-up study, they discover that this assessment polarization to some degree reflects hidden cultural partitions. They examine suggestions for assessment based gathering exploration and general wellbeing efforts [1].

Factional assessment coordination is dynamic and erratic yet it can have grave ramifications for society. During a pandemic, when many should act on the whole to ensure the weak few, it is essential to keep up with non-sectarian fortitude in broad daylight wellbeing mentalities. We have introduced a clever method for recognizing factional disposition arrangement, and the conceivable beginning of restricting assessment based gatherings, that could illuminate ways of vaccinating general wellbeing messages against hardliner translations [3].

The COVID-19 worldwide pandemic has produced a wealth of exploration rapidly following the flare-up. Inside a couple of months, in excess of 1,000 investigations on this theme have effectively showed up in the logical writing. In this short audit, they examine the biblio metric parts of these examinations on a large scale level, just as those tending to Corona viruses overall [8]. Besides, through a perusing investigation of the writing on COVID-19, they distinguish the fundamental security related aspects that these investigations have hitherto tended to. Their discoveries show that across different exploration spaces, and aside from the clinical and clinical angles like the security of immunizations what's more medicines, issues connected with patient vehicle security, word related wellbeing of medical services experts, bio safety of research centers and offices, social wellbeing, sanitation, and especially mental/mental wellbeing and home grown wellbeing have hitherto drawn in most consideration of mainstream researchers corresponding to the COVID-19 pandemic [9]. Our examination additionally reveals different possibly huge security issues brought about by this worldwide wellbeing crisis which as of now have drawn in just restricted logical concentration yet may warrant more consideration. These incorporate matters, for example, digital security, financial wellbeing, and inventory network wellbeing [10].

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These discoveries feature why, from a scholarly examination point of view, a comprehensive interdisciplinary methodology and an aggregate logical exertion is needed to help comprehend and alleviate the different wellbeing effects of this emergency whose ramifications reach far past the bio-clinical dangers. Such comprehensive security logical comprehension of the COVID-19 emergency can moreover be instrumental to be more ready for a future pandemic [2].

The phenomenal rate at which logical distributions connected with the COVID-19 pandemic are arising, and the enormous cultural worries connected with numerous viewpoints connected with the effects of the pandemic, makes incorporating logical information more significant than any other time in recent memory [6]. Considering this, the point of the current work was to catch, report and illustrate the degree and extent of the academic exploration endeavors that have been led on COVID-19 and the overall class of Covid. Specifically, different significant examination aspects of the interest to the security research local area are distinguished, which may assist professionals and leaders with understanding significant parts of word related, physical, clinical, and public wellbeing [5]. Quick and opportune amassing of information and experimental proof is basic for policymakers and crisis directors confronted with this emergency to maximally illuminate their choices through logical proof. It is trusted that this study can contribute towards speeding up furthermore working with these logical endeavors and bringing the security suggestions of this worldwide crisis to the consideration of the security research local area [7]. Such ramifications, as exhibited by the sciento metric investigations and the checking survey, go a long ways past the natural and immunological perspectives and of the exploration on antibodies and clinical treatment, which are clearly logical needs. Rather, these wellbeing suggestions additionally incorporate elements connected with the non-actual wellbeing and mental prosperity of general society and especially clinical experts, just as issues connected with the insurance of social security, food handling, patient vehicle security and the bio safety of offices and labs [4].

III. FACE RECOGNITION EMBEDDED WITH DISTANCE MEASURE SENSOR DEVICE

Spread of Omicron variant thirty times faster than Covid-19 virus, within no time it is spread from human to human due to not maintain social distance in an organization. Indian government suggested to take vaccination three doses to protect from this virus, validity period of these doses is up to six months, all these doses will improve immunity power, heavy population country it is difficult to give vaccination to all population, and also all are not in a position to bear vaccination cost.

In this research paper, we proposed a new method of face recognition embedded with distance measure sensor devices and it is working in five phases. In first phase movements of employees are captured using drones and CC cameras, in phase two all captured images are send to distance measure sensor devices, in phase three check distances with threshold values and if not met send details to next phase, in phase four face recognition technique is used to identify ids of persons who are not maintaining social distance, and in phase five output is presented to end user. The proposed model of predicting spread of omicron variant is shown in figure 1 and proposed model is working based following machine learning algorithm.
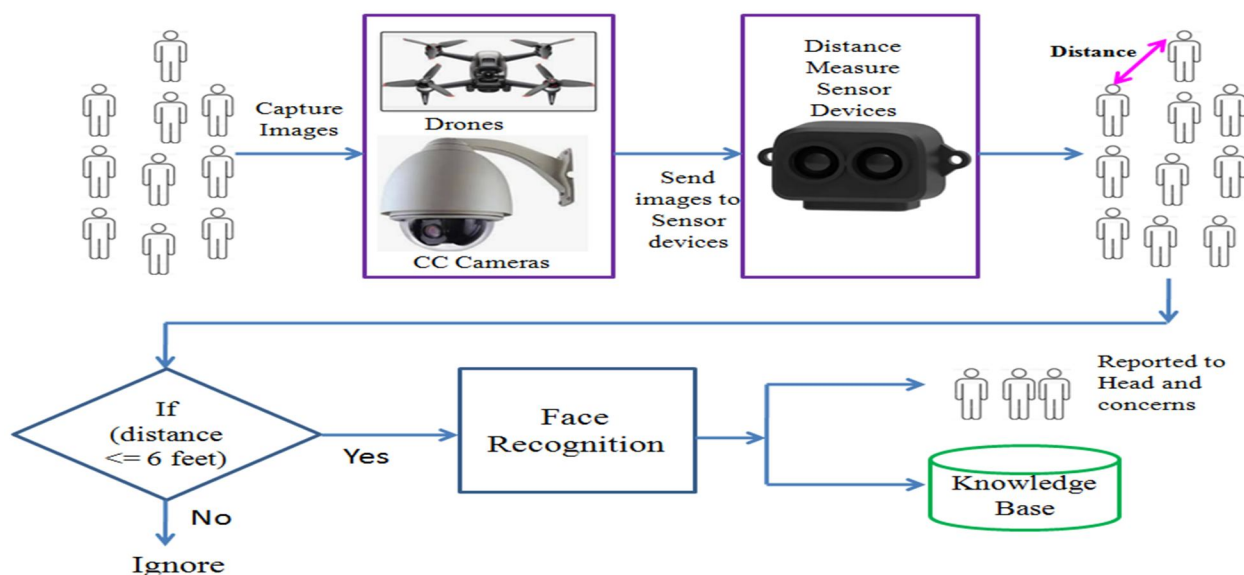

Figure 1: proposed model.

1) *Algorithm:* face recognition embedded with distance measure sensor using machine learning techniques
2) *Inputs:* Social distance Threshold value T, employee images, captured images by using drones and CC TV cameras.
3) *Output:* List of employees who are not following social distancing

A. *Method*
1) *Step 1:* Each and every employee three or more face images are loaded into database with employee id number.
2) *Step 2:* Threshold value of distance is assigned (Example, minimum distance between people is six feet). T=6.
3) *Step 3:* Capture employees images using drone cameras and CC TV cameras.
4) *Step 4:* Captured images are send to distance measure sensor devices.
5) *Step 5:* Sensor devices measure distance (d) between every pair of employees.
6) *Step 6:* If d less than or equal to T then simply ignore data or otherwise send details to face recognition module.
7) *Step 7:* Face recognition module identify employee id those who are violating social distance.
8) *Step 8:* List of employees who are not followed social distance is send to higher officials and concern people to take necessary precautions.

IV. CONCLUSION

Contrasted with less tough measures, full lockdowns delivered extensively more noteworthy results on the climate. Moreover, meteorological variables, like precipitation and temperature, unequivocally impacted the groupings of poisons in a space, albeit a few of the qualified studies neglected to address the job of climate conditions in their estimation results. The air contamination information had all the earmarks of being predictable between the satellites and the ground-level checking, however the absence of indistinguishable investigations blocked us from measurably confirming this understanding. Ultimately, the lockdown-driven upgrades in air quality will be inadequate just as unreasonable except if severe, locale explicit natural arrangements are carried out. In our life virus imposed many pandemic situations with different time slots. In December 2019 pandemic is started due to Covid-19 corona virus, still virus is spreading by changing its structure, Indian government approved few vaccinations to fight against virus, as per the instruction of government all are taken two doses of vaccination, these vaccine are working up to five months, now government suggesting to take third dosage, every five months once taking vaccine is not possible to all humans and it will cost more, and in addition to vaccine our idea is to educate human to maintain covid-19 protocols to control spread of virus. To educate people to maintain social distancing we proposed a method to predicting spread of omicron covid-19 variant by face recognition embedded with distance measure sensor using machine learning techniques and it is working in five phases**.** In first phase movements of employees are captured using drones and CC cameras, in phase two all captured images are send to distance measure sensor devices, in phase three check distances with threshold values and if not met send details to next phase, in phase four face recognition technique is used to identify ids of persons who are not maintaining social distance, and in phase five output is presented to end user. To control covid-19 virus proposed model is used to identify list of employees who are not following social distancing, same list is forwarded to heads, and well as concern employees. The proposed method gives better results to break pandemic and it is useful to predict spread of virus to other peoples.

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