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Artificial intelligence powerful weapon against "COVID-19"

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ABSTRACT: The first infected patient of novel coronavirus case (COVID-19) was found in Wuhan, China in Dec. 2019. The COVID-19 infection pandemic has now spread over 214 countries and all areas in the world, and has significantly affected every aspect of our daily lives. The numbers of infected cases and deaths still increase significantly and have no sign of a well-controlled situation, as of 14 April 2020, a cumulative total of 1,853,265 (118,854) infected (dead) COVID-19 cases were reported worldwide. Motivated by recent advances and applications of artificial intelligence (AI) and big data collected in various areas, this paper aims at emphasizing their importance in clearly responding to the COVID-19 outbreak and preventing from the severe effects of the COVID-19 pandemic. We first present an overview of AI and data, then identify their important applications in fighting against COVID-19, next highlight challenges and issues associated with state-of-the-art solutions, and finally come up with recommendations for the communications to effectively control the COVID-19 situation. It is expected that this paper will provide researchers and different healthcare communities with new insights, new advancements in the field of AI and data improve the COVID-19 situation, and drive further studies in stopping the COVID-19 outbreak.

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INTRODUCTION:

Coronavirus disease-19 (COVID-19), caused by a novel coronavirus, has changed the world significantly, not only the healthcare system, but also economics, education, transportation, politics, etc. Infected COVID-19 people normally experience respiratory illness and can recover with effective and appropriate treatment methods. What makes COVID-19 much more dangerous and easily spread than other Coronavirus families is that the COVID-19 coronavirus has become highly efficient

in human-to-human transmissions. As of the writing of this paper, the COVID-19 virus has spread rapidly in 215countries, causing infected 1,853,265 people, and 118,854 dead cases. The United State of America (USA) is currently the country with the highest COVID-19 cases, where a new day has recently seen around 30,000 confirmed cases and nearly 2,000 deaths. Some other countries like Italy, Iran, Germany, France, and the United Kingdom are also enormously influenced. However, there are no clinical vaccines to prevent the COVID-19 virus and specific drugs/therapeutic protocols to combat this communicable disease.

As the leaders in the war against the novel coronavirus, the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC) have released a set of public advice and technical guidelines [1,2]. The cooperation between and efforts from national governments and large corporations are expected to significantly reduce risks from the spread of COVID-19 outbreak. For example, as a search engine giant, Google launched a COVID-19 portal, where we can find useful information, such as coronavirus maps, latest statistics, and most common questions on COVID-19. Another example is that IBM, Amazon, Google, and Microsoft with White House developed a supercomputing system for research relevant to the coronavirus [3]. In response to the pandemic, some publishers now offer free access to the articles, technical standards, and other documents related to the COVID-19-likevirus, while web archival services like arXiv, medRxiv, and bioRxiv create a fast link to collect all preprints related to COVID-19 [4]. On the other hand, artificial intelligence (AI) and big data have found a lot of applications in various fields, e.g., AI in computer science, AI in banking, AI in agriculture, and AI in healthcare. These technologies are expected and may play important roles in the global battle against the COVID-19 pandemic.

To better understand and alleviate the COVID cases, where a new day has recently seen around 30,000 confirmed cases and nearly 2,000 deaths. Some other countries like Italy, Iran, Germany, France, and the United Kingdom are also enormously influenced. However, there are no clinical vaccines to prevent the COVID-19 virus and specific drugs/therapeutic protocols to combat this communicable disease. As the leaders in the war against the novel coronavirus, the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC) have released a set of public advice and technical guidelines [5-7]. The cooperation between and efforts from national governments and large corporations are expected to significantly reduce risks from the spread of COVID-19 outbreak. For example, as a search engine giant, Google launched a COVID-19 portal (www.google.com/ COVID19), where we can find useful information, such as coronavirus maps, latest statistics, and most common questions on COVID-19. Another example is that IBM, Amazon, Google, and Microsoft with White House developed a supercomputing system for research relevant to the coronavirus [8]. In response to the pandemic, some publishers now offer free access to the articles, technical standards, and other documents related to the COVID-19-likevirus, while web archival services like arXiv, medRxiv, and bioRxiv create a fast link to collect all preprints related to COVID-19 [9]. On the other hand, artificial intelligence (AI) and big data have found a lot of applications in various fields, e.g., AI in computer science, AI in banking, AI in agriculture, and AI in healthcare. These technologies are expected and may play important roles in the global battle against the COVID-19 pandemic.

To better understand and alleviate the COVID 19 which is called as SAARC-Cow-2 (a disease caused by SARS virus) which was found in December 2019 in Wuhan, China, also known as China virus. On March 11, 2020, Corona (COVID 19) was declared a pandemic by the WHO. The virus has spread to almost all countries, with very few countries where fortunately COVID 19 has not yet reached (North Korea, Solomon Islands, Tajikistan, Yemen), while the virus has affected both developed and underdeveloped countries. The health systems and security systems of all these nations are fighting against the spread of the virus, but unfortunately no one has any concrete treatment, treatment method, or vaccine available for them. It is working very effectively and efficiently as well as against Artificial Intelligence (AI) COVID 19 [10-13]. It is being used very effectively by all nations at all levels in the battle of and is also proving to be very beneficial. This means that in computer science it is also called machine intelligence and this system is much more efficient than the natural intelligence shown by man.

With the help of computer software, computer systems and algorithms, many such things can be done very effectively and more efficiently. Contrary to the way human intelligence has many constraints. AI has the extraordinary efficiency of handling data, processing data, and analyzing data very effectively, and many of

these features have been exploited by humans for their own benefit and are being used effectively by humans on many levels. In epidemics like COVID 19, mainly on several fronts that are early diagnosis, data handling, data processing, contact tracing, safety and measures [14-19].

WORKING OF AI IN BATTLE OF COVID-19 [20,21]:

Early warnings and instructions:

BlueDot is also an AI. The module helps detect COVID-positive patients among people with communicable diseases, and BlueDot is the first AI to alert its clients before the WHO's emergency alert.

Many AIs like HealthMap, ArogyaSetu Modules are currently available that are useful for early diagnosis and warning.

Expedition:

A.I. A large number of devices are being used to track the timely spread of COVID 19 which is being used for planning, preparation and management. It also provides answers to many questions such as where we are on the epidemiological curve and how long it will take for the ascending graph to descend.

Data dashboard:

Many AI devices like UpCode, Nextstain, HealthMap, Microsoft Bing's AI tracker. Modules have been developed to visualize information.

Diagnosis and prognosis:

As the SARS-CoV-2 pandemic is emerging, however, the information available has continuously been accessible on the basis of the efficacy of some treatments. In order to make a quick and accurate diagnosis, to prevent the spread of the disease and to save the lives of patients, AI during X-ray and CT-SCAN mainly for diagnosis. Accurate diagnosis of infection is being made using modules.

Treatment and care:

Various forms of AI systems, such as deep learning and Handcraft engineered features are used to make the highly detailed results fast and radio diagnosis and also help to distinguish between cancerous and non-cancerous cells by taking far less time and also reducing the manual steps. Research Center and Information Center Modulus and AI. Linked to Davis, which helps speed up testing of new drugs and vaccines. Importantly, with the new drug, it is useful to test the drugs at a faster pace, to draw conclusions from them, as an example of how time consuming things happen faster; while Deep Mind is doing a "protein structure prediction" of the virus. It is beneficial for the search for drugs and vaccines.

Social control:

By testing as many people as possible to keep people infected in a crisis like an epidemic away, AI can be used to effectively bridge social gaps. Modules are being used. GPS tracking is proving to be beneficial for tracking home quarantined mergers.

Uses of AI in India at present [22-24]:

- L&T Company uses smart technology in 20 major cities to help local administrations monitor crowds, track patients, communicate with people, and maintain law and order.
- Medium health, Arogya setu app is being used to give people the knowledge they need about COVID 19, to give them accurate information about their symptoms and to overcome people's fears.
- AI to provide the necessary services and to resolve corona related queries. Modules are being used. Most importantly, APOLO HOSPITAL has brought a risk assessment scanner for COVID 19 which is available in 6 languages and guides people about the potential risk of infection.
- A robot developed by CLUB ONE is being used at Sawai Mansingh Hospital in Jaipur to prevent health workers from getting infected.
- Using intelligent drones and robots to plan the necessary measures to prevent the spread of the virus.

CONCLUSION:

AI plays a significant role in the fight against COVID-19, at least from the epidemiological, diagnostic and pharmaceutical points of view but we have to extensively use AI devices and modules to fight with COVID-19 until and unless a cure is found out. Its use is constrained by a lack of data and by too much noisy and outlier data. The creation of unbiased time series data should be created for AI training. A growing number of international initiatives in this regard are encouraging; however, there is an imperative for more diagnostic testing.

Not only for providing training data to get AI models operational, but also for more effectively managing the pandemic situation and reducing its cost in terms of human lives and economic damage.

At the time of writing, the significant efforts of all affected countries have been to shut down their economies through lockdowns, enforcing social distancing, and canceling events. These measures seem, for now, to have succeeded in slowing down the spread. However, whether these measures are sustainable for more than a couple of weeks is doubtful. More diagnostic testing will be helpful to eventually halt the pandemic, limit the economic damage from lockdowns, and avoid a rebound once restrictions are relaxed. Mathias Dewatripont and his colleagues make a case for extensive diagnostic testing of the population to allow people to return to work only if they are not infectious to others, to place in quarantine those who are. Many times they also call for more randomly sampled tests in order to improve estimates of the proportion of the population with the virus that will remain asymptomatic. At present, we just do not know how many people are infected. More importantly, it may be, as a study in Science suggests, that 86 percent of all infections may be remained undocumented. If this is the case, then the danger of a rebound of the pandemic is highly likely. Thus, overcoming data in the terms of who is infectious is very critical.

Finally the data is central to whether AI will be an effective tool against future epidemics and pandemics situations. Flexibility to gather and analyze big data promptly is essential in combating the pandemic, even if it may require that the authorities collect more personal data than many people would feel comfortable with. Therefore, it is crucial that the authorities take particular care in their handling of such data and their justifications and communications to the public at large.

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