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CORONAVIRUS: AI StepsUp In the Battle to Tackle thePandemic

Artificial intelligence helping to fight against the COVID-19 by predicting which patients is in the chance to develop the respiratory disease from the virus.

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Abstract:In this current scenario of the Novel Coronavirus people are struggling to fight against this outbreak. So the development in today's technology helps in most of the ways to fight against the pandemic. Advancements in AI application such as natural learning processing, speech recognition, data analytics, machine learning and others such as chatbots and facial recognition have not only been used for diagnosis but also for contact tracing and vaccine development. So AI helps us in most of the ways to fight against the virus attack.

One of the greatest mysteries that is looming around is how exactly the SARS-Cov-2 virus has made a leap to human beings. Scientists who have analyzed the virus claim that it has likely spread from a wet market in China where the animals are for sale and slaughter. However, scientists are still in search of the truth behind the deadly pandemic. As the virus spreads around the globe and people are staring at this unprecedented situation, perhaps technology can find a solution to slow down the death count. Various agencies around the world have used AI to create various modes of application and algorithms to inform the rapid spread of the virus.

Artificial Intelligence more commonly called AI can warn people or scientists about the upcoming events or the intensity of the spread of Coronavirus so that it gives enough time for the scientists and other experts to prepare. As one such AI area Canadian start-up Bluedot and Metabiota.

Bluedot is a very good example to tackle the coronavirus, a global artificial intelligence database company which uses AI-powered algorithms, machine learning to analyze or track the multitude of sources to prevent the spread of this infectious disease.

On December 31st onwards Bluedot started sending out warnings to its customers about a ''unusual pneumonia'' case happening around the market in Wuhan, China. With the help of this AI, the experts had spotted about the prediction of COVID-19 before the World Health Organization released its statement alerting people about the pandemic.

But in December, "we didn't know at that moment that this was going to become something of this magnitude," says, Kamran Khan, founder and CEO of BlueDot and professor of medicine and public health at the University of Toronto.

Bluedot helps to cut data from hundreds of thousands of sources to identify the relevant source including statements like public health organization, digital media, livestock, health reports etc for the researchers to produce medicines and vaccines for the coronavirus. It can produce a ton of information every 15 minutes, 24 hours a day.

The software also gathers the data and develops a taxonomy which helps for easier classification and gets all the information as quickly as possible. Therefore relevant keywords could be scanned efficiently for the applied machine to train the system.

In addition to it, the engine has successfully predicted the Zika virus that would spread to Florida in 2016, and also this software predicted the 2014 Ebola six months before its outbreak and predicted that would leave West Africa.

"What we have done is use natural language processing and machine learning to train this machine to recognize whether this is an outbreak of anthrax in Mangolia versus a reunion of the heavy metal band Anthrax," Khan says.

On the other hand, Metabiota's latest public report, on February 25, predicted that on March 3 there would be 127,000 cases around the world." According to Mark Gallivan, the firm's director says, "This is still well within the margin of error. The machine also listed the countries which are likely to report new cases such as China, Italy, Iran and the US.

But we cannot forget how social media also took the role to tackle the virus too. Stratifyd, a data analytic company based in Charlotte, North Carolina is also developing an AI which can scan posts on the sites of Facebook and Twitter, which helps to cross-refer them with the description of disease taken from the various sources such as National Institute of Health, the World Organization for Animal Health, and the global microbial identifier database.

Role of AI In Developing COVID-19 Vaccine

Though we can slow down the spread of COVID-19 through social distancing and various other precautions, scientists are still trying to develop drugs and vaccines to treat its symptoms.

As Artificial Intelligence is running in a race to find a vaccine it plays a prominent role to suggest various medical experts to various research papers to find the different components to study about the virus and its viral protein structure. In addition to this, a team at the Allen Institute uses AI, Google DeepMind, and other data sets to find out a vaccine which can suspend the coronavirus.

One of the essential roles of the AI is to help the scientist to make a 3D shape of the virus and its protein, though the virus is made up of a sequence of amino acids. So with the help of AI by using cutting edge systems such as AlphaFold which creates a 3D structure of the protein in which it makes a clear understanding of the protein structure and how it works.

At the same time, a potential COVID-19 vaccine has been developed by various scientists with the help of AI and cloud computing. There are several start-ups which have come forward to take an initiative to battle against the COVID-19. For that, they begin with analyzing the patient's information, reading their clinical diagnosis, the molecular structure and how it responds to the vaccine. However, if it works then, they will start developing a candidate vaccine which will be taken as a trial test in animals. After all, if the vaccine has shown a positive result the experts can ask permission from the medical experts to test the vaccine in human beings who are suspected with corona.

So far with the help of such advanced technologies, we can check how long the people are adapting to these vaccines and how he/she would survive and how these results vary in different people.

AI Helps to Flatten the Death Count.

In the world, it is the first time that with the help of artificial intelligence in the medical field it has developed a drug that has become much faster and more effective to treat people than ever before. A drug called DSP-1181 is the first non-made drug molecule that has now entered in phase 1 clinical trials as per the European Pharmaceutical review reported. The molecule that is developed with the use of AI is a long-acting potent serotonin 5-HT1A receptor agonist.

In addition to people who are having health problems and needed a CT scan, AI is speeding up the diagnosis with the help of Alibaba's research institute Damo Academy. The Damo Academy has developed a diagnosis algorithm on which 5,000 confirmed coronavirus cases have been identified. It works by differentiating the CT scans between the patients who are infected and asymptomatic.

As the infected cases are increasing in every corner of the country, there is a lack of severe medicinal equipments that are required for the diagnostic results. A Beijing based oncology data platform in China has developed an AI that helps to collect the data records of people who are suspected with corona.

In Wuhan China, a company called Shenzhen Micro MultiCopter (MMC) has launched 100 drones to spray the disinfectants in public places. In a Guangdong Provincial People's Hospitalin China is using two autonomous robots and similarly in Wuhan field hospital opened an entire ward run by robots, the ward is using 12 sets of 5G-powered robots to protect the medical staff and helps them to taking patient's vitals, sending real updates to doctors, delivering food and medicine and removing medical wastes. And also in Hangzhou city in China the hospital ambulances are assisted by AI for helping more causality.

In United States, the global death toll surpasses more than 50,372. A security agency called Athena Security which previously used a system to detect weapons is now marketing artificial intelligent thermal cameras to send an alert to the people who are having coronavirus and fever.

An Indian startup Agrex.ai is usingtechnology called fever detection screening solution attached with a thermal has scanned almost 80-100 people per minute at a distance up to 20 meters with the help of facial recognition, and also it scans the body temperature. In addition to the company has also developing other technologies like enforcing social distancing through CCTV cameras, mask/PPE detection kits.

"It is a thermal sensor-based detection system that is capable of scanning a large number of people from a distance up to 20 meters. The camera comes with a ready to use plug and play system which can be set up within 10 minutes." says Arush Kakkar , Founder,Agrex.ai

At this scale of increase in the number of patients day by day the health officials are also tracking the suspected patients with the use of various other techniques such as contact tracing, mobile tower location, Google heat map, timelines, and other sophisticated surveillance detection to find out where the virus has been spread, but some countries like Austria, Italy, Belgium and U.K are collecting anonymized data to study the movement of the people in a more general way. To a larger extent, AI has helped government officials and drug companies to move fast to find a solution to the COVID-19.

All these predictions and initial preparations have let authorities and other experts help to take safety measures, alerting hospital and putting the precautionary measures to safeguard the people. There has been confusion over the symptoms of this virus, so AI as a machine learning technology help these experts to prevent the spreading from hundreds of sites in dozens of countries by collecting various reports and another news source to make things better to fight against this deadly pandemic.

Keywords: Artificial Intelligence, AI, Coronavirus, COVID-19, BlueDot, Vaccine, AlphaFold, Thermal-Sensor, Analytical data.

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