Why is AI the leading effective weapon in the fight against COVID-19?

The new strain of Corona virus (COVID-19) is one of the highest infectious diseases on our blue planet in decades.

In just over three months since being discovered in China, COVID-19 has spread to more than 90 countries, infecting more than 185,000 people, and claiming more than 3,500 lives.

In the face of governments and health organizations seeking ways to prevent the spread of corona virus, all help is welcome, including assistance from artificial intelligence. While AI technology is still a long way from being able to simulate human intelligence, they are increasingly proving useful in monitoring disease, diagnosing patients, disinfecting infected areas. , and speed up the search for a cure for COVID-19.

Data science and machine learning are two of the most effective weapons we have in the fight against the corona virus pandemic.

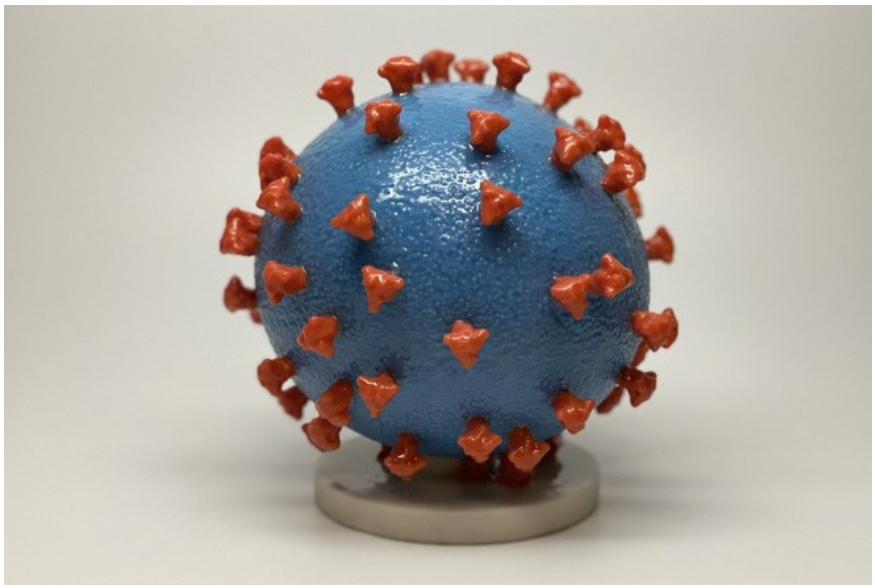
Track disease with machine learning

Just before the start of the new year 2020, an artificial intelligence platform called BlueDot, which tracks infectious diseases worldwide, marked a group of "unusual pneumonia" cases that appeared around a Market in Wuhan, China. Nine days later, the World Health Organization (WHO) announced the discovery of a new strain of corona virus in the body of a person with pneumonia in Wuhan.

BlueDot uses natural language processing algorithms and machine learning to read information from hundreds of sources, to detect early signs of infectious pandemics. The AI ??looks for announcements from health organizations, commercial flights, livestock health reports, satellite weather data, and newsletters. With the vast amount of corona virus related data generated every day, the AI ??algorithm can help filter out data that can provide valuable information about the spread of the virus. It can also find important relationships between data points, such as patterns of movement of people living in areas most affected by the virus.

The company also employs dozens of experts in many fields, including geographic information systems, spatial analysis, data modeling, computer science, and infectious disease health professionals. clinical, tourism and tropical medicine, and public health. Information reviewers have been marked by AI earlier and sent out reports of what they discovered.

Combined with the help of human experts, BlueDot's AI can not only predict the beginning of a pandemic, but also predict how it will spread. In the case of COVID-19, AI successfully identified cities where the virus could spread after it was "exposed" in Wuhan. Machine learning algorithms studying the moving model predict where people exposed to the corona virus are likely to go.



Use computer vision to detect infection of corona virus

You may have seen the COVID-19 monitoring and screening process at border gates and airports. Health officials use heat guns and observe signs of fever, cough, and shortness of breath in passengers.

Computer vision algorithms can do the same thing but on a much wider scale. An AI system developed by Chinese tech giant Baidu uses cameras that integrate computer vision and infrared sensors to predict the temperature of people in public areas. The system can monitor up to 200 people per minute and detect their temperature with a deviation of only 0.5 degrees Celsius. AI will mark anyone with a temperature above 37.3 degrees Celsius. Currently used at Qinghe Railway Station, Beijing.

Alibaba, another Chinese tech giant, has developed an AI system that can detect corona virus in chest CT scans. According to the researchers who developed this system, AI has a 96% accuracy. AI is trained based on a data set of 5,000 corona virus cases and can carry out a test in 20 seconds, compared to 15 minutes like when human experts diagnose patients. It can also tell the difference between corona virus and the virus that causes pneumonia. This algorithm will empower health centers that are under pressure to monitor patients for COVID-19 infection. It is known that this system is currently being implemented in 100 hospitals across China.

A separate AI developed by researchers from Renmin Hospital of Wuhan University, Wuhan EndoAngel Medical Technology Co., and China University of Geoscience, achieved 95% accuracy in COVID-19 detection in chest CT scans. The system is a deep learning algorithm trained on 45,000 anonymous CT scans. According to a document posted on medRxiv, the performance of AI is comparable to that of radiologists.

Robots in the front line in the fight against COVID-19

One of the main ways to prevent the spread of corona virus is to limit contact between infected patients and people who have never been exposed to the virus. As a result, many companies and organizations have sought to automate a number of procedures that previously required health workers and medical teams to interact with patients.

Chinese companies are now using drones and robots to conduct air-to-air delivery and spraying disinfectant in public areas to minimize the risk of cross-contamination. Other robots are used to check the fever and other symptoms of COVID-19 on the sick person, and dispense soap and hand sanitizer free of charge.

In hospitals, robots are used to distribute food and medicine to patients and disinfect rooms to reduce nurse work. Other robots handle cooking without supervision, reducing the number of employees needed to operate a medical facility.

In Seattle, doctors use robots to communicate with patients and treat them from afar to minimize contact between medical staff and infected people.

China uses robots to spray disinfectant in public places

AI helps accelerate drug research

The fight against corona virus is not over until we have developed a vaccine to help people to be immune to this virus. But drug development is a very long and costly process. This can cost more than $ 1 billion and take up to 12 years. It is clearly a timeline we cannot have in the context of the virus continuing to spread at an increasingly fast pace.

Fortunately, AI can help speed up this process. DeepMind, the AI ??laboratory that Google acquired in 2014, recently announced the use of deep learning to find new information related to the protein structure of COVID-19. This is a common process that takes months to complete.

Understanding the protein structure may provide important clues to formulating the vaccine for corona virus. DeepMind is one of many organizations racing to develop this vaccine. They have been using the results of decades of machine learning, as well as results from protein studies.

Drug research process

" *Our structure prediction system is still in development, and we are unsure about the accuracy of the structures we provide, although we are confident that this system is more accurate than our CASP13 system* "- DeepMind developers said. " *We confirm that our system used to provide accurate predictions about the spike protein structure of SARS-CoV-2 through empirical examinations, shared in the protein data bank, and that That gives us the confidence that our predictive model for other proteins will be useful* . "

While it's too early to tell if we're on the right track, the above efforts are commendable. Less than a day in the process of finding a vaccine for corona virus, hundreds, or even thousands of lives will be saved.