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Research Article

Machine learning Helps in Quickly Diagnosis Cases of "New Corona"

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ABSTRACT

Machine learning is considered one of the most significant techniques that play a vital role in diagnosing the Coronavirus. It is a set of advanced algorithms capable of analyzing medical data and identifying patterns and behaviors of diseases. It is used to interpret medical images, giving details of each image with high accuracy and efficiency, such as chest X-ray images. These algorithms are trained on a large set of images to recognize patterns that indicate the presence of infection with the Coronavirus (COVID-19). This article will provide a brief overview of the importance of machine learning in diagnosing COVID-19 by processing and analyzing medical image data and helping physicians and healthcare workers provide distinguished and influential care for patients infected with this virus.

1. INTRODUCTION

Machine learning (ML) is proving to be a tool, in the battle against COVID-19 assisting doctors in diagnosing the disease through an approach that involves analysing medical images making predictive models and integrating data [1-3]. One of the main ways machine learning is used in diagnosing COVID-19 is by analysing medical imaging data [4][5]. Chest X rays and CT scans are commonly employed to identify infections, including COVID-19 [6][7] (see Figure 1). ML algorithms are trained on datasets of these images learning to recognize patterns associated with the disease. Convolutional Neural Networks (CNNs) are widely utilized for image analysis, in this context [8-10]. These algorithms can rapidly. Examine images to detect abnormalities or distinctive features that indicate COVID-19. This helps radiologists make timely diagnoses. Medical professionals utilize machine learning models to analyse a range of demographic data enabling them to predict the probability of an individual having COVID-19 based on their symptoms and other pertinent factors. These models consider variables, like age, preexisting health conditions and recent travel history to offer a comprehensive evaluation. By incorporating information from health records and other reliable sources these models aid doctors in identifying individuals, at high risk who may require immediate testing or close monitoring. Machine learning plays a role, in creating models that can anticipate how COVID-19 might progress in individual patients. By examining a patients data lab test results and other pertinent information these models make predictions, about the severity of the disease and the chances of complications arising.

We hear a lot about the concept of machine learning and its applications in many fields, right? In fact, it is a marvellous magic concept with applications in many different areas, and it is a golden key for a large group of researchers. Unfortunately, in the world we live in, we do not have super solutions that fit everything or solve very complex problems. There are different points of view in books, social media, and Internet sites about the concept of machine learning, its theories, and its applications in various fields. Despite these different perspectives, it has become one of the essential topics that circulate significantly in the scientific and academic milieu, as it has proven its strength and success in solving some issues and problems and drawing actual results that assist many in completing their work perfectly. Machine learning is characterized by giving accurate statistics that help in decision-making (as if it gives advice in determining the correct direction to avoid falling). Some people ask a set of questions about machine learning: The first question: Is machine

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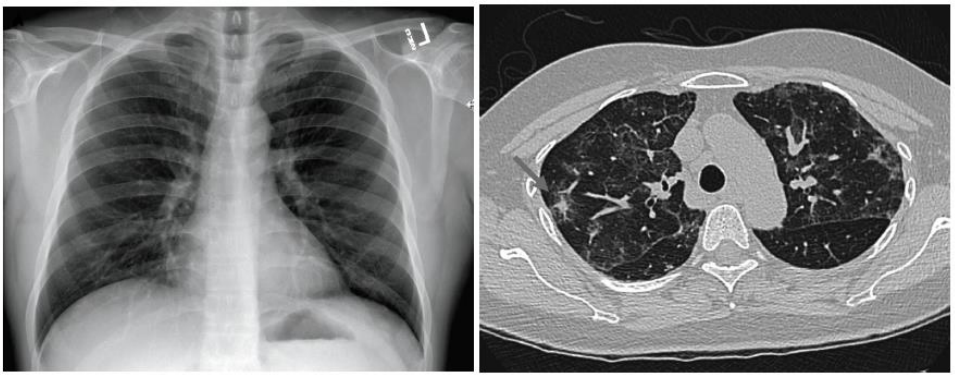
learning artificial intelligence? we can answer this question with yes and no. Machine learning is a subcomponent of artificial intelligence, and it is one of the parts and components of artificial intelligence. The next question is, what will we see when we search online for machine learning applications? our answer will be no comment on this question. we will not include it here, guys. You will explore and browse topics of interest to you using machine learning. Never lose your desire to learn new things. Guys, remember the famous quote by Obi-Wan Kenobi is a character in the Star Wars franchise, "May the Force be with you", Learning and reading are the evidence of rising to the top—this advice by authors to all people trying to advance sciences.



(a) (b)

Fig. 1. (a) Example of chest X rays, (b) Example of CT-scan [11][12].

To take an example of vehicles, someone wants to buy a vehicle, and after a deep and serious search in the car market, he discovers that the price of vehicles this year is 22 thousand dollars; he also finds that used vehicles, which are one-year-old, cost 18 thousand dollars, while two-year-old cars cost 14 thousand and so on. What we notice here is that the vehicle reduces its price annually by 4 thousand dollars. The lowest price you reach is 10 thousand dollars, for example. This is an example of regression, which is a price prediction based on past information. Here we alert about only two pieces information about the vehicle (the product), which is the price and year, but much other information we must pay attention to, such as the condition of the vehicle, the demand for it, its advantages over others, its type and many other variables, and a normal person cannot know all these things about all vehicles in the market. Here we use the machine, we provide her with the data and information that we have about the products, and we ask her to find all the patterns that are not clear to us. This is why we want to use the machine to solve such a problem, which is prediction.

To perform such a process, we are required to utilise a mathematical model that provides the results. The mathematical model always requires simplifications and assumptions as it contains the mathematical equivalent of the interactions in the natural physical practice. In our world, as everything changes at any moment, changes may begin to occur in the system we want to check. If the mathematical model begins to deviate from the natural system, then introducing the control that makes the model happy could lead to natural disaster in the natural system. Well, suppose you train an artificial neural network with these observations of the natural system behaviour. In that case, you might conclude that the artificial neural network becomes a copy of the natural system and may change its behaviour from time to time according to the changes that occur in the natural system, adaptation, that is, if it remains ANN always a current and realistic clone of the physical system ... and if you count the control entries accordingly to make this clone happy. If we can train the ANN well, i.e., if we create a good copy and then input the control that will make the clone happy, that will also make the clone truly happy.

2. BREADTH OF COVID'S IMPACT

Let's come to a conclusion and link machine learning to our new reality called COVID-19. Studies on diagnosing patients with COVID-19 with deep learning, which has recently emerged as a machine learning method, have already begun to be published. The problem primarily exists because machine learning practices historical data to profile behaviours and predict future effects. Suppose the recent behaviours have changed drastically and continue to be volatile. In that case, static machine learning solutions would not stand a chance and would be inaccurate at best and misleading at most critical. Artificial intelligence is beneficial in sharing information about the epidemic situation. For example, information about clinical trials, new insights into how the disease is developing, etc. Thanks to artificial intelligence, data can now be shared in real-time with practitioners such as doctors, medical staff, scientists, and research laboratories worldwide. Physicians worldwide can now access databases and get the latest ideas in seconds. This is a fantastic contribution. It also definitely helps a lot in the vaccine preparations. We know it must be tested on animals first and then on humans - and that can't be

done by AI. Machine learning can decisively deliver a set of effects in referring pictures of people with COVID-19 disease and comparing them with those with pneumonia and it is able to determine the percentage of virus present in the human lung. Machine learning has an extensive use case across all industries and sectors. However, not all industries or use cases are affected by the Coronavirus's data shifts. As we evaluate and see around us, only areas where machine learning is being applied to capture consumer/end-user behaviour have been affected because that's the only thing that COVID-19 has changed. So, for example, Alexa has yet to stop understanding English, and self-driving cars suddenly have not forgotten how to drive because there is no user behaviour here. What has developed is our lifestyle, our daily needs, our online presence, etc. Figure 2 displays the count of confirmed cases and fatalities attributed to Covid-19 (latest information as of March 10, 2023).

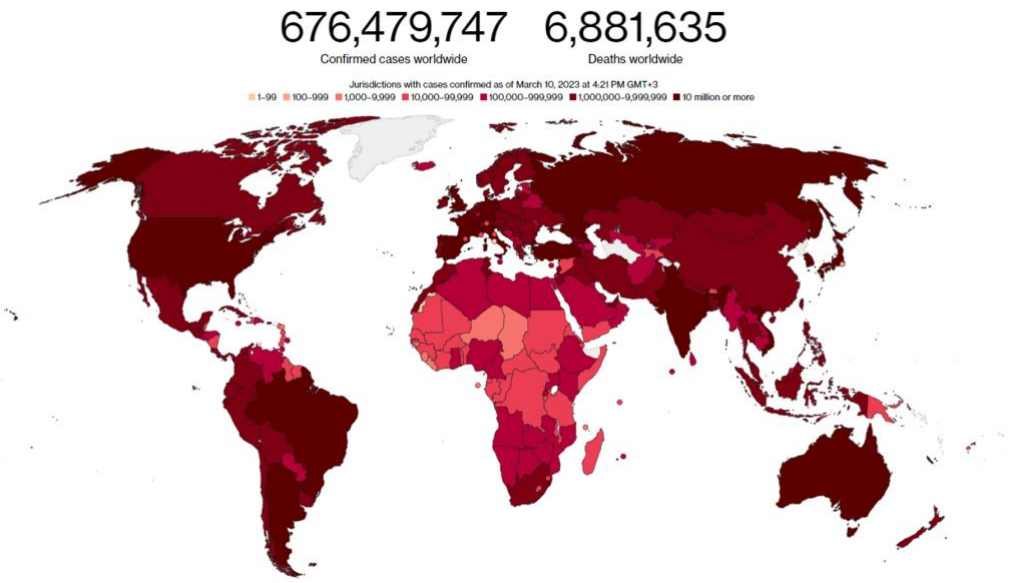


Fig. 2. Number of Confirmed and deaths cases resulting from COVID-19 [13].

Machine learning techniques on chest CT scans and the patient's medical history led to determining the percentage of a person's disease with a sensitivity equal to that diagnosed by a chest radiologist." Researchers explain in the current published studies, "In light of the new Coronavirus invading the world, there is an urgent need for speed Accurate diagnosis of infected cases, which is very necessary. CT-scan is also an important tool in diagnosing patients with COVID-19 infection, but these rays alone are not sufficient to exclude cases of COVID-19 in some patients with other lung diseases. Also, CT-scan results may appear normal for some patients in the early stages of their disease. After seeing many studies, we have found that machine learning models contribute to improving the detection of positive cases of COVID-19 that are made and which were normal CT-scans of their owners, as it helps to modify the diagnosis and correctly detect the rate of infection and determine the strength of the disease. Considering that the accuracy rate of the PCR (Polymerase chain reaction) test, which is used in the diagnosis of COVID-19 patients today, is around 70%, it can be interpreted that the machine learning method will be useful in increasing the diagnostic accuracy, although it may not be used alone, but with other tests.

3. CONCLUSION

Machine learning is significant in diagnosing coronavirus diseases by harnessing its ability to analyze massive datasets and study new patterns. Machine learning algorithms in medical imaging excel at recognizing patterns in chest X-ray and CT scan images. These algorithms are trained on a dataset and identify anomalies associated with COVID-19 to help doctors and healthcare workers make more efficient diagnoses and improve patient outcomes. Machine learning algorithms are trained to analyze clinical and demographic information to predict the likelihood of contracting coronavirus disease based on symptoms, travel history, and other relevant factors. Ultimately, these algorithms have the potential to advance the diagnostic process to help healthcare workers develop their ability to effectively identify, track, and manage COVID-19 cases to improve patient outcomes and save lives.

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Conflicts Of Interest

The paper states that there are no personal, financial, or professional conflicts of interest.

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