

# Literature Review On: Covid Prediction Using Image Processing and ML

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## Abstract

Due to the rapid increase in the number of new and suspected cases of COVID-19, there may be a role for artificial intelligence (AI) methods for the detection or expression of COVID-19 in the image. CT Scan provides a clear and quick view of this process, in-depth study of large CT Scan data may provide productive biomarkers to differentiate COVID-19 Diseases.. We will train the model using CT imaging and we will use it to predict. Photo captions will be done after guessing to make the report look better. We will also use CNN's method to predict COVID using individual signals. Finally we will make the final decision based on the two approaches above. Our approach will accelerate the detection of COVID cases and ultimately reduce the spread of coronavirus.

**Keywords:** covid-19, ct scan

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## I. INTRODUCTION

The Corona virus spread to Wuhan, China in December 2019 and became a major public health problem worldwide. The virus that causes the COVID-19 epidemic is called acute acute Respiratory Syndrome coronavirus-2 (SARS-CoV-2). Coronaviruses (CoV) is a large family of viruses that cause infections such as Middle East Respiratory Syndrome (MERS-CoV) and Server Acute Respiratory Syndrome. COVID-19 is a new version discovered in 2019 and has never been seen in humans. COVID-19 causes mild symptoms in about 99% of cases, according to preliminary data, and some are more complex or sensitive. As of October 4, 2020, the number of people infected with Coronavirus worldwide has reached 35,248,330. Of these, 1,039,541 (4%) were killed and 26,225,235 (96%) were found. Of these, 7,917,287 (99%) had minor illnesses and 66,267 (1%) had serious illnesses. Today the world is suffering because of COVID-19. Deaths of pneumonia are increasing due to the increasingly SARS-CoV-2 virus. Chest rhyography (X-ray) is one of the most important diagnostic tools used worldwide. it requires knowledge and expertise. It is much harder to diagnose using a chest X-ray than other imaging modalities such as CT or MRI. By looking at a chest X-ray, COVID-19 can only be detected by professional doctors.

Due to the rapid increase in the number of new and suspected cases of COVID-19, there may be a role for artificial intelligence (AI) methods of detection or exposure of COVID-19 in the image. CT provides a clear and fast window through this process, and extensive international CT data research may provide automated and reproducible biomarkers for the detection and testing of COVID-19. Previous research by one institute has shown the potential for AI to be infected with COVID-19, or to differentiate community-acquired pneumonia. AI models are often severely limited in use due to the similarity of data sources, which limits the performance of other citizens, demographics, or locations. This study aims to develop and evaluate the AI algorithm for the detection of COVID-19 in CT chest using data from multiple, multi-site websites. Here we present robust models that can achieve up to 90% accuracy in independent diagnostic studies, maintain high specificity of non-COVID-19 pneumonia, and demonstrate adequate fulfillment of the unspecified patient facility.

## II. METHODS

All procedures are performed in accordance with the relevant guidelines and regulations.

### Suggested models

Transfer reading, Fast.AI, CNN architecture

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Several in-depth research networks are used to successfully diagnose COVID-19. Among them, CNN is the main source of classification, classification, and prediction of COVID-19. In Figure 1 he presents a research framework based on the in-depth study of COVID-19, in which the system uses an in-depth learning algorithm to predict that images. patient lungs suspected to be common, with bacterial pneumonia, or COVID-19.

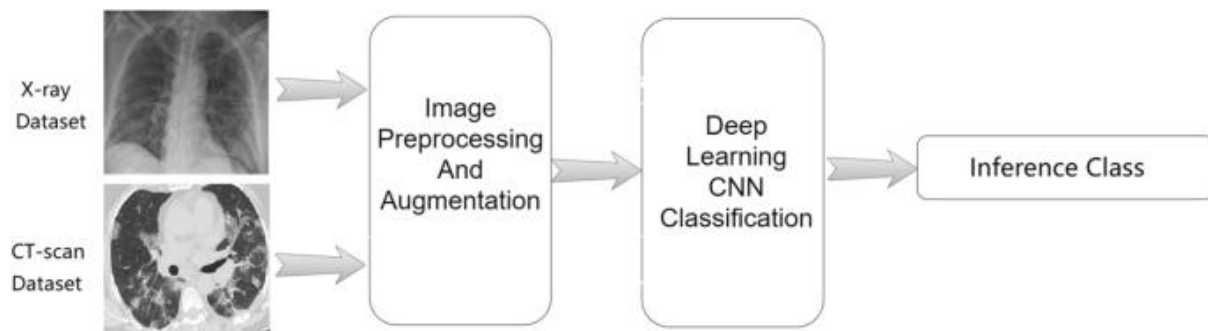


Figure 1 A test structure of COVID-19 based on Deep Learning.

## 2.1 DEEP LEARNING

In 2006, Hinton and Salakhutdinov published an article in the journal Science that was the gateway to the DL age. They showed that the neural network with hidden layers played an important role in enhancing the learning ability of the genes. These algorithms can improve the accuracy of classifying different types of data. One of the major applications of DL in the field of radiology was the discovery of bone-bone abnormalities and the division of disease. DL algorithms and the most effective way to detect abnormalities and infections on chest radiographs. Since the outbreak of COVID-19, much research has been done on analyzing data related to DL algorithms, particularly CNN. Using different algorithms and DL formats, these studies began to identify and identify different COVID-19. Here, these studies are systematically analyzed. This study was conducted through a systematic review to identify studies related to the identification and identification of COVID-19. The official search strategy is based on previous studies as well the views of the authors.

## 2.2 SEARCH NAMES

1. To what extent has the use of DL been able to improve the standard diagnostic methods of COVID-19?
2. What methods can be used to help diagnose and diagnose COVID-19 using DL?
3. Has DL been able to close diagnostic errors?
4. How effective are the different types of DL and its derivatives in promoting the availability of COVID-19 compared to others?

Researchers reviewed electronic data to identify medical and computer science subjects and concluded that PubMed, Web of Science, and Scopus contain the highest number of publications related to current theory.

## 2.3 RELEASE OF DATA

Appropriate studies, details of their methods, and their results are recorded in the data extraction form. Data selection and extraction is done based on Figure 1. To identify DL algorithms and methods, key method details and their results are recorded on the extraction pages. Two researchers released the data, and the differences between the studies were resolved through interviews. Output data items include research name, country, year of publication, population of the study, method, data used, DL strategies, test methods, and results.

## III. EFFECTS

Initially, 160 quotes and full text articles were examined, and finally, 37 articles that met the inclusion criteria were selected. The PRISMA method is adopted in the article selection process. Due to the new strain of the disease, all selected articles were published in 2020. Of the 37 published articles, eight were published in India, five in China, five in the United States, and three in Turkey. In addition, Iran, Greece, Italy, and Egypt each presented two research papers, while Morocco, Bangladesh, Spain, Colombia, Iraq, Brazil, Canada and South Korea presented one study each.

Purpose of an In-Depth Analysis of Radiology Diagnosis on COVID-19. Diagnostic-based diagnostic methods play an important role in the evaluation of the affected case. CXRs and CT scans are among the major radiology methods of detecting and diagnosing COVID-19. In all studies reviewed here, radiological images. were analyzed to obtain COVID-19 via DL. This study was performed on two common terms, “detection” and “diagnosis,” indicating the presence of COVID-19. However, in the field of medical image analysis, these two terms are used interchangeably. By examining existing documents and dictionaries and seeking the advice of

radio experts and epidemics, the discovery is defined as part of a real or imagined business that can be proven or disputed. In medical literature, a diagnosis is considered to be a precursor to diagnosis. Similarly, in the case of COVID-19, many studies have used both terms interchangeably, but medically they are different. By separating the two terms into one, the findings were considered in this study as separating COVID-19 cases from non-COVID-19 cases. This means that no information is available about the type of disease in non-COVID-19 patients, and this group may have different strains of bacterial pneumonia, viruses, or other groups with coronavirus infection other than COVID-19. We also look at the diagnosis as a different name for COVID-19 in other infectious diseases of the lungs as different types of pneumonia. Diagnosis makes sense in stages where all other diseases (without COVID-19) are well defined, and COVID-19 can be confidently classified as a type of pneumonia or other coronaviruses. In this regard, by examining published articles, it was found that 15 articles use DL to obtain (identify) COVID-19 /

On the other hand, many articles have found COVID-19 through DL algorithms. In these cases, COVID-19 is accurately identified between different types of pneumonia. Some studies have analyzed radiology methods to find and diagnose simultaneously. Figure 2 shows the studies on the detection and diagnosis of COVID-19. As noted earlier, diagnostic impairment of CT scan images. in detecting the conditions of COVID-19 its low specificity. This study found that several studies have attempted to improve these methods in analyzing CT scan images. with DL techniques. Clearly, these methods owe their success in detecting lung ulcers caused by COVID-19 in the removal and selection of hidden traits. Apart from advances in the detection and diagnosis of COVID-19 by DL algorithms, one of the major drawbacks of this method in the diagnosis of COVID-19 was the lack of this device in all medical and diagnostic facilities. In addition, many patients with COVID-19 needed more chest imaging using CT scans. Exposure to radiation during a CT scan creates serious patient problems scan tunnel.

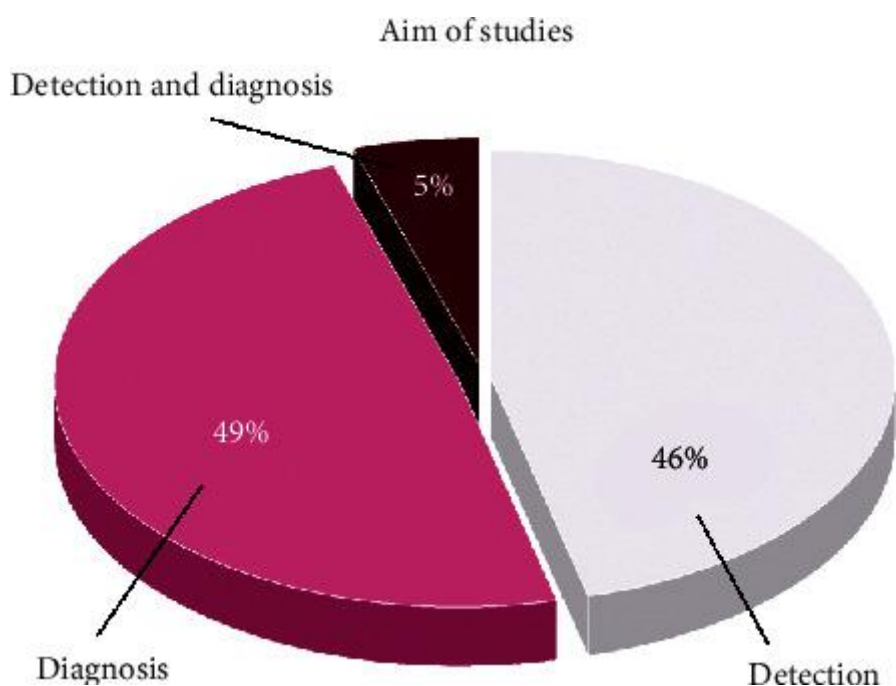


Figure 3

**The purpose of the studies in analyzing COVID-19 radiology methods using DL.**

Therefore, many researchers and clinicians have turned to explicit radiographic or X-ray images. identifying COVID-19. However, these images. they do not have the necessary solution and accuracy in diagnosing COVID-19 early and have many disadvantages in this regard. Therefore, artificial intelligence researchers rushed to assist medical professionals and used DL as a powerful tool to improve the accuracy of COVID-19 detection by X-ray images. Due to the nature of DL in the removal of image elements, this technology is able to detect patients with COVID-19 and remove infectious lung tissue, many studies have developed various DL methods to analyze these images./In the early days of the breakdown of COVID-19, CT scan was very common in its diagnosis, but over time. , X-rays. Therefore, the study also shifted from CT scan image analysis to radiographic image analysis. Figure 3 shows the analysis rate of the two methods used to diagnose and diagnose COVID-19.

#### IV. DISCUSSION

This systematic review evaluated 37 studies to help researchers analyze and develop information-based systems based on the practical wisdom of detecting and diagnosing COVID-19. To our knowledge, the current review, which reviewed a variety of DL methods for analyzing radiological images, is one of the most comprehensive studies for the diagnosis and diagnosis of the Disease. The latest update provided the latest information on DL algorithms and their use as a COVID-19 image for audio graphics. analysis. The use of this inexpensive and affordable method should be considered a reliable method of diagnosing COVID-19. By reviewing 23 research papers on the use of X-rays in the diagnosis of COVID-19 using DL methods, the current method may be presented to the scientific and medical community to diagnose the disease as soon as possible. By developing imaging technology with artificial intelligence technology, we can find the cheapest and safest scanning methods to prevent the spread of COVID-19. A review of published studies has shown that the diagnosis of the disease by DL algorithms under the supervision of a radiologist has led to improved performance and reduced diagnostic errors in various cases of pneumonia, especially COVID-19. The standard diagnosis of all subjects using the X-ray method had a sensitivity level > 95%, clarity > 91%, and a higher diagnostic level than those reported in traditional methods.

It can also be concluded that the specification of CT scans detected by the DL method in the event of COVID. Due to the extreme similarity of the effects of COVID-19 on lung tissue with different types of bacteria and pneumonia, the diagnosis of these diseases by untreated means is very difficult and complicated. Examination of algorithms and DL structures revealed that almost all studies use the CNN algorithm; Yes, other algorithms have also been used as well as CNN's algorithm in some studies. The CNN structures used in these studies all have special features in image analysis, and without adjusting their parameters, it is impossible to have access to these COVID-19 diagnostic and diagnostic capabilities.

#### V. CONCLUSION

As discussed earlier, early detection and diagnosis of COVID-19 by DL techniques and low costs and complications are important steps in preventing the disease and advancing the epidemic. In the near future, with the introduction of DL algorithms into radiology equipment, it will be able to achieve faster, cheaper, and safer diagnoses. The use of these methods in the decision-making process of the COVID-19 can be a powerful tool for radiologists to minimize human error and can help them make informed decisions in extreme cases and feature climax. This study supports the idea that DL algorithms are a promising way to improve health care and improve the results of diagnostic and therapeutic procedures. Although DL is one of the most powerful computer diagnostic tools for pneumonia, especially COVID-19, engineers should be careful to avoid excessive immersion and enhance the completeness and usefulness of the COVID-19 DL diagnostic models; these models must be trained in a large, diverse database to cover the entire range of available data.

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