



**COPY RIGHT**



# ELSEVIER

## SSRN

**2021 IJIEMR.** Personal use of this material is permitted. Permission from IJIEMR must be obtained for all other uses, in any current or future media, including reprinting/republishing this material for advertising or promotional purposes, creating new collective works, for resale or redistribution to servers or lists, or reuse of any copyrighted component of this work in other works. No Reprint should be done to this paper, all copy right is authenticated to Paper Authors

IJIEMR Transactions, online available on 29th Aug 2021.

Link : <http://www.ijemr.com/downloads.php?vol=Volume-10&issue=ISSUE-08>

**DOI: 10.48047/IJIEMR/V10/I08/19-16**

**Title:- IMAGE BASED DEEP LEARNING FOR COVID-19 DIAGNOSIS**

Volume 10, Issue 08, Pages:235-239

Paper Authors

Mr.CH.Venkatesh<sup>1</sup>, Arigela Sripoojitha<sup>2</sup>, Jujjavarapu Uma Krishna Sri<sup>3</sup>, Vedala Jahnvi Meghana<sup>4</sup>



Editor IJIEMR



www.ijemr.com

To Secure Your Paper As Per **UGC Guidelines** We Are Providing A Electronic Bar Code

## IMAGE BASED DEEP LEARNING FOR COVID-19 DIAGNOSIS

Mr.CH.Venkatesh<sup>1</sup>, Arigela Sripoojitha<sup>2</sup>, Jujjavarapu Uma Krishna Sri<sup>3</sup>, Vedala Jahnvi Meghana<sup>4</sup>

<sup>1</sup>Assistant Professor, Dept. of CSE, <sup>2</sup>17ME1A0563, <sup>3</sup>17ME1A0581, <sup>4</sup>17ME1A05B9  
Ramachandra College of Engineering, A.P., India

### ABSTRACT:

Covid-19 is a rapidly spreading viral disease that infects not only humans but animals are also infected because of this disease. A clinical study of COVID-19 infected patients has shown that these types of patients are mostly infected from a lung infection after coming in contact with this disease. Chest x-ray (i.e., radiography) is the most effective imaging technique for diagnosing lung-related problems. Health industry following the manual process for diagnosing. So, we developed this project to bring the latest trend of technology into the diagnosis of medical sciences. Deep learning is the most successful technique of machine learning, which provides useful analysis to study a large amount of chest x-ray images that can critically impact on screening of Covid-19. In this work, we have taken the PA view of chest x-ray scans for covid-19 affected patients as well as healthy patients. After cleaning up the images and applying data augmentation, we have used deep learning based CNN models and compared their performance.

### 1. INTRODUCTION

The main aim of the project is to train and build a model that can be efficiently used for classifying covid-19 images from non covid-19 images and extend the model for medical image classification based on deep learning. Hence “covid-19 diagnosis using image based deep learning” is designed to meet the needs of health industry and implemented developed to enhance the entire process of extracting patterns and learning relationships in this kind of ‘unstructured’ data. Other aims include reducing the human interaction and time.

The application of deep learning in the field of COVID-19 image processing reduces false-positive and negative errors in the detection and diagnosis of this disease and offers a unique opportunity to provide fast, cheap, and safe diagnostic services to patients.

There is a much need of the system entitled “covid-19 diagnosis using image based deep learning”. The alternative to an automated diagnosis system would be to have an expert clinician look at your data (perhaps discuss it with fellow experts) to determine the outcome. Every time clinician observes the reports and gives a manual report to doctors for the future treatment. This process involves time and effort.

The health care industry is one of the largest industries in the world, and it has a direct effect on the quality of life of people in each country. Health care is the diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in humans.

Deep learning is an Artificial Intelligence (AI) function that imitates the working of the human brain in processing data and creating patterns for use in decision making. Deep learning is a subset of machine learning in Artificial Intelligence that has networks capable of learning

unsupervised from data that is unstructured or unlabeled. Also known as deep neural learning or deep neural network.

## 2. RELATED WORK

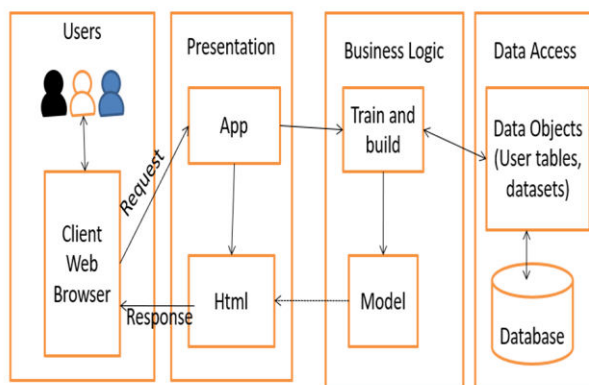
### Existing System :

In the existing system the number of people with corona is getting huge integers, manual classification takes a while lot of time and for each decision requires a medical expert, may be difficult. It is very time consuming which may leads to severe situations and it is also need a lot of manual controlling and is also very expensive to afford.

### Proposed System :

To overcome the drawbacks of existing system, the proposed system has been evolved. Our system primarily focuses on building an efficient way of classifying medical X-ray images using image based deep learning. It is a relatively fast approach when compared to the existing system to get the count and it is highly reliable and gives exact count .We can save lot of time and this is very easy to control.

## 3. METHODOLOGY:



**Figure 1: System Architecture**

**Presentation Layer (PL):** It is located in the outermost layer; popular talk is the

interface showed to users, users' WYSIWYG when using a system. Its functions contain receiving data inputted, interpreting users' instructions, and sending requests to the data services layer and displaying the data obtained from the data services layer to users by the way they can understand. It closest to users and provide an interactive operation interface.

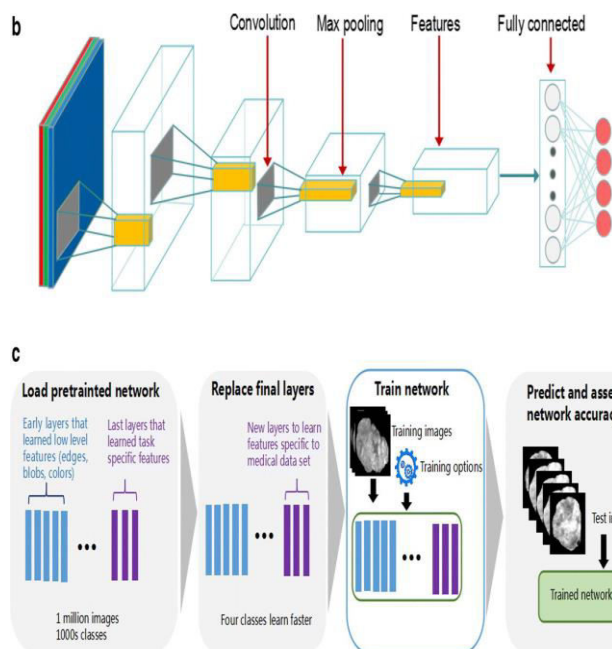
**Data service layer (DSL):** It is located between the presentation layer and business logic layer (BLL). As the isolation layer, it will separate the business logic from the client, so as to guarantee the security of information. According to the needs of each module, data services layer encapsulates the business logic on high level. Operational activities played a role of confidentiality. For large software systems, cross-platform distributed computing and server farms between communications are essential, which is the function of the service layer's establishment. The main function of DSL is referring data processed by BLL to its immediate upper layer (presentation layer) or transferring data submitted by PL to its directly below that is BLL according to the specified model definitions.

**Business logic layer (BLL):** It is located between the PL and data access layer (BLL), playing a connecting role in the data exchange. Business logic layer is 7 responsible for the various types of business operations of system, the completion of the corresponding functions, which are issue-specific operations, the data business logic processing. The layer's concerns are focused primarily on the development of business rules, business processes and business needs related 760 systems, meaning that it is related to area

of systems addressed by the logic. Very often, it's also known as the domain layer. **Data access layer (DAL):** It is located in the innermost layer that implements persistence logic. The function of this layer is responsible for access to the database; you can access the database system, binary files, text documents or XML document. Operations on the data contain finding, adding, deleting, modifying, etc. This level work independently, without relying on other layers. In accordance with upper layer's requests, DAL extracts the appropriate data from the database and passes the data to the upper. DAL also does the CRUD operations on the data in the database in accordance with the instructions of the upper. The execution flow of the four-layer Design diagrams using UML approach.

through radiology modalities and their processing based on deep learning. According to the findings, deep learning-based models have an extraordinary capacity to offer an accurate and efficient system for the detection and diagnosis of COVID-19, the use of which in the processing of modalities would lead to a significant increase in sensitivity and specificity values.

The Unified Modelling Language (UML) is a standard language for writing software blue prints. UML stands for Unified Modelling Language. UML is different from the other common programming languages like C++, Java, and COBOL etc. UML is a pictorial language used to make software blue prints. So, UML can be described as a general-purpose visual modelling language to visualize, specify, construct and document software system. Although UML is generally used to model software systems but it is not limited within this boundary. It is also used to model non software systems as well like process flow in a manufacturing unit etc. UML is not a programming language but tools can be used to generate code in various language using UML diagrams. UML has a direct relation with Object Oriented analysis and design. After some standardization UML has become an OMG (Object Management Group) standard. UML diagrams are the ultimate output of the entire discussion. All the elements, relationships are used to make a complete UML diagram and the diagram represents a system.



**Figure 2: Deep learning**

This review study provides an overview of the current state of all models for the detection and diagnosis of COVID-19

## 4. STUDY OF RESULTS:



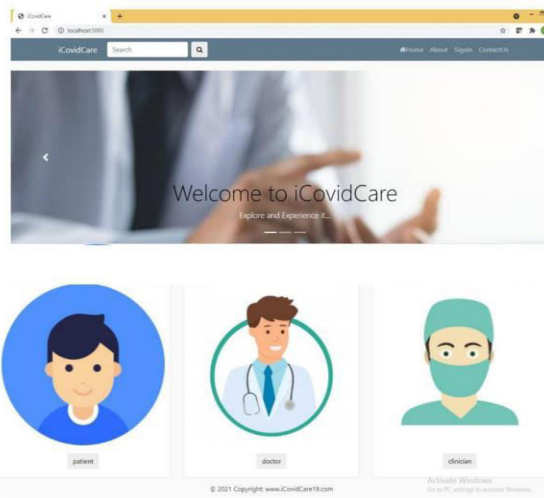


Figure 3: Welcome page

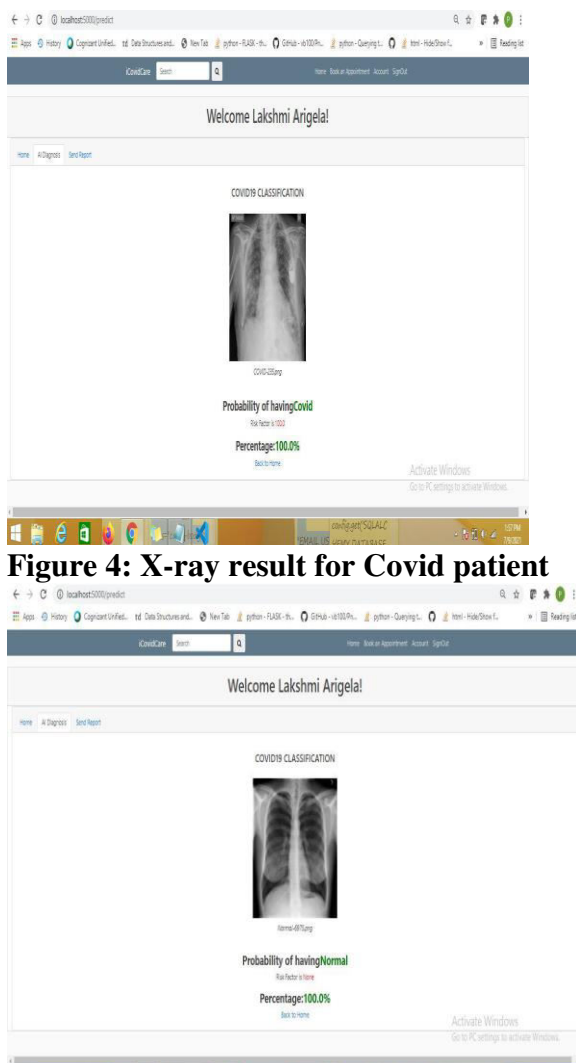


Figure 4: X-ray result for Covid patient

Figure 4: X-ray result for Normal person

## 5.CONCLUSION :

Identifies the problem in diagnosing the COVID 19 patient x-rays and aimed to establish an automation process which accurately distinguished corona and non-corona affected patients on chest x-rays. This has potential for generalized high impact application in biomedical imaging. Infected patients of Covid-19 are required to be in isolation, do proper screening, and take adequate protection with prevention to protect healthy people. This infection is following a chain process that transfers from one person to another after coming in contact with covid-19 infected persons. Hospital staff, nurses, doctors, and clinical facilities play an essential role in the diagnosis of this epidemic.

It is not possible to develop a System that makes all the requirements of the user. User requirements keep changing as the system is being used. Some of the future enhancements that can be done to this system.

As the technology emerges, it is possible to upgrade the system and can be adaptable to desired environment. Building and improving medical algorithm that can automatically detect abnormalities in some other medical problems. Furthermore development is needed for the easy access and fast classification of the model.

Covid-19 pandemic is a growing manifold daily. With the every increasing number of cases, bulk testing of cases swiftly may be required. In this work, we experimented with multiple CNN models in an attempt to classify the Covid-19 affected patients using their chest X-ray scans.

Further, we concluded that out of these three models, the Xception net has the best performance and is suited to be used. We have successfully classified covid-19 scans, and it depicts the possible scope of applying such techniques in the near future to automate diagnosis tasks.

## 6. REFERENCES :

1. N. Chen, M. Zhou, X. Dong et al., "Epidemiological and clinical characteristics of 99 cases of 2019 novel corona virus pneumonia in Wuhan, China: a descriptive study," *The Lancet*, vol. 395, no. 10223, pp. 507–513, 2020.
2. C. Huang, Y. Wang, X. Li et al., "Clinical features of patients infected with 2019 novel corona virus in Wuhan, China," *The Lancet*, vol. 395, no. 10223, pp. 497–506, 2020. View at: [Publisher Site](#) | [Google Scholar](#)
3. C. M. A. De O. Lima, "Information about the new corona virus disease (COVID-19)," *Radiologia Brasileira*, vol. 53, no. 2, 2020.
4. T. Struyf, J. J. Deeks, J. Dinnes et al., "Signs and symptoms to determine if a patient presenting in primary care or hospital outpatient settings has COVID-19 disease," *Cochrane Database of Systematic Reviews*, vol. 7, no. 7, 2020.
5. J. Liao, S. Fan, J. Chen et al., "Epidemiological and clinical characteristics of COVID-19 in adolescents and young adults," *The Innovation*, vol. 1, no. 1, Article ID 100001, 2020. Yan L, Zhang HT, Xiao Y, Wang M, Sun C, Liang J, Li S, Zhang M, Guo Y, Xi.
6. ao Y, Tang X (2020) Prediction of criticality in patients with severe Covid-19 infection using three clinical features: a machine learning-based prognostic model with clinical data in Wuhan. *medRxiv*
7. Xu B, Meng X A deep learning algorithm using CT images to screen for Corona Virus Disease (COVID-19)
8. Fu S, Fu X, Song Y, Li M, Pan PH, Tang T, Zhang C, Jiang T, Tan D, Fan X, Sha X (2020) Virologic and clinical characteristics for prognosis of severe COVID-19: a retrospective observational study in Wuhan, China. *medRxiv*
9. Ilyas M, Rehman H, Nait-ali A (2020) Detection of Covid-19 from chest X-ray images using artificial intelligence: an early review. *arXiv preprint arXiv:2004.05436*