# Detection of Covid-19 using Chest X-Ray

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June 2023

## Abstract

COVID-19 (coronavirus disease 2019) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a strain of coronavirus. The first cases were seen in Wuhan, China, in late December 2019 before spreading globally. The current outbreak was officially recognized as a pandemic by the World Health Organization (WHO) on 11 March 2020.

Currently,reverse transcription polymerase chain reaction (RT-PCR) is used for diagnosis of the COVID-19. X-ray machines are widely available and provide images for diagnosis quickly so chest X-ray images can be very useful in early diagnosis of COVID-19. This project aims at using the X-ray images to predict if a patient is diagnosed with Covid-19. The development of an accurate and efficient predictive model based on chest X-ray images could aid healthcare professionals in making informed decisions and allocating resources effectively to manage and control the spread of COVID-19.

## Dataset Description

Dataset Description The Dataset consists of 6432 x-ray images and contains three sub-folders (COVID19, PNEUMONIA, NORMAL). 80% of the data will be used to train our network and the remaining to test the predictions.

## Motivation

This project aims to leverage chest X-ray images to develop a predictive model for COVID-19 diagnosis. By analyzing the characteristics and patterns observed in these images, the model seeks to accurately predict whether a patient is diagnosed with COVID-19. The proposed approach offers the potential for a faster and more accessible diagnostic method, especially in areas where RT-PCR testing resources may be limited.
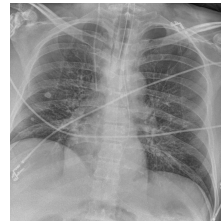


(a) Normal                    (b) Covid 19

Figure 1: X-Ray Images of Normal and Covid Diagnosed Person

## Expected outcome

- **Tool impact:** This would give physicians an edge and allow them to act with more confidence while they wait for the analysis of a radiologist by having a digital second opinion confirm their assessment of a patient's condition. Also, these tools can provide quantitative scores to consider and use in studies.
- **Data impact:** Image data linked with clinically relevant attributes in a public dataset that is designed for ML will enable parallel development of these tools and rapid local validation of models. Furthermore, this data can be used for completely different tasks.

## Methodology

The project will be carried out in the following steps

- **Preprocessing:** In this step, we will normalize and standardize the image data to ensure consistency and remove any variations in image quality or intensity. The dataset will then be split into training and test sets.
- **Model Building:** A CNN model will be designed which will be used to predict the probability of a patient being diagnosed with Covid -19. The model will then be trained using the dataset to learn the features from the X-Ray images.
- **Evaluation and Results:** Finally, our model will be evaluated using the test dataset and the results will be noted down which will indicate if the proposed model can be used to detect Covid-19 cases.

## References

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