Covid_19 Detection Through X-Rays

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ABSTRACT

Covid-19 is a rapidly spreading viral disease that infects not only humans, but animals are also infected because of this disease. The daily life of human beings, their health, and the economy of a country are affected due to this deadly viral disease. Covid-19 is a common spreading disease

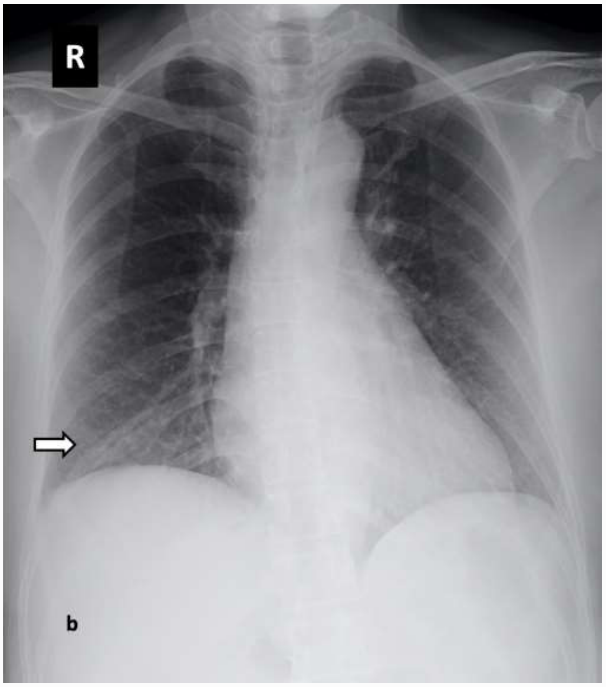
A clinical study of COVID-19 infected patients has shown that these types of patients are mostly infected from a lung infection after coming in contact with this disease. Chest x-ray (i.e., radiography) and chest CT are a more effective imaging technique for diagnosing lunge related problems. Still, a substantial chest x-ray is a lower cost process in comparison to chest CT.

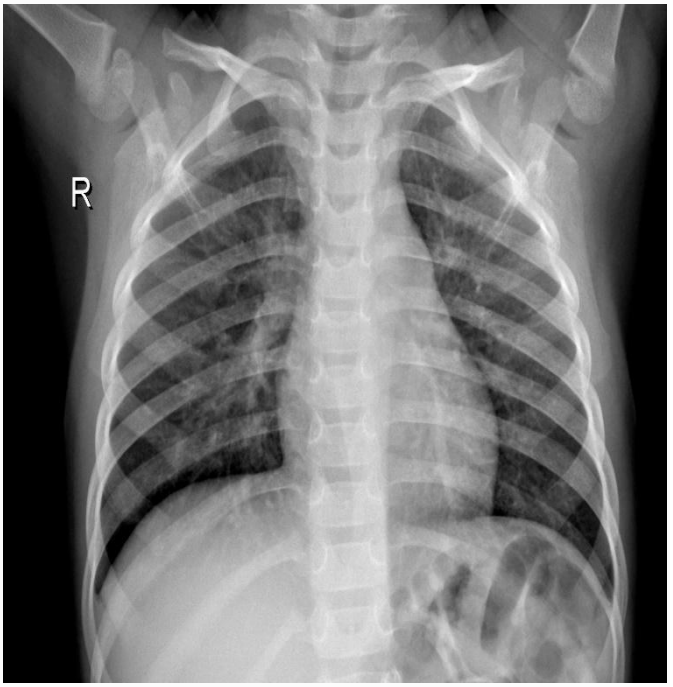
In this work, we have taken the PA(posteroanterior) view of chest x-ray scans for covid-19 affected patients as well as healthy patients. And applying data augmentation, we have used CNN models.

To analyse the model performance, 284 chest x-ray scans samples have been collected from the Kaggle repository, out of which 224 were used for training and 60 for validation**. In result analysis, the model gives the accuracy of 93.33% for detecting Chest X-rays images**. This work only focuses on possible methods of classifying covid-19 infected patients and does not claim any medical accuracy

CAN YOU TELL WHICH ONE IS COVID-19 POSITIVE?

(A) (B)





WE ARE NOT RADIOLOGIEST, SO WE

DON'T KNOW

BUT WITH ARTIFICIAL INTELLIGENCE WE CAN KNOW

THROUGH THE CODE, WE GET TO KNOW (A) IS COVID-19 POSITIVE AND (B) IS NORMAL

INTRODUCTION

Covid-19 is a severe disease issue where a large number of people lose their lives every day. This disease affects not only a single country, and even the whole world suffered because of this virus disease. In the past decade, several kinds of viruses (like SARS, MERS, Flu, etc.) came into the picture, but they stand for only a few days or few months. Many scientists are working on these kinds of viruses, and few of them prepared the vaccines prepared.

In the present time, the whole world is affected by Covid-19 disease, and the most important thing is no single country scientists provided the ultimate cure for it.

Meanwhile, many more predictions came into a picture such as plasma therapy,and many more, but the exact solution of this deathly disease is not found. Every day, people lose their life due to covid-19, and the diagnostic cost of this disease is very high in the context of a country, state, and patients.

In March 2020, X-ray images of healthy people and Covid-19 infected peoples were available online in different repositories such as GitHub, Kaggle for analysis. Covid-19 is an epidemic disease that threatens humans at a global level and turned into a pandemic.

To diagnose covid-19 infected patients with healthy patients is a critical task. The dialysis of Covid-19 infected patients needs more precaution and must be cured under very strict procedures to reduce the risk of patients unaffected with covid-19

The novel coronavirus disease came first as a throat infection, and suddenly people faced difficulty in breathing. The covid-19 illness is a hidden enemy

where no one is capable of fighting. 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. Many more strategies have been applied to reduce the impact of Covid-19. Medical imaging is also a method of analysing and predicting the effects of covid-19 on the human body. In this, healthy people and Covid-19 infected patients can be analysed in parallel with the help of CT (Computerised Tomography) images and chest X-ray images.

For contributing to an analysis of Covid-19, we collected uploaded data of X-ray images of healthy and covid-19 infected patients from different sources and analysed them with the help of CNN, a machine learning tool.

This work mainly focuses on the use of CNN models for classifying chest X-ray images for coronavirus infected patients. We have attempted to draw a parallel to the previous work in the field and look for potential models of the task, which can be assessed further to prove their usefulness in practical scenarios.

MATERIALS & METHODS

The dataset used and the methodology used is explained in the subsequent sections.

DATASET: -

The dataset of this work has been collected from Kaggle repository, which contains Chest X-Ray scans of Covid-19 affected and normal. This collected dataset is not meant to claim the diagnostic ability of any Deep Learning model but to research about various possible ways of efficiently detecting Coronavirus infections using computer vision techniques.

The collected dataset consists of 284 total chest X-ray images. This data set is further divided into training and validation set of normal and covid. In the training set, 112 is normal, and 112 are covid. In the validation phase, 30 samples of a normal case, and 30 covid were considered for this analysis.

Method: -

We detect COVID-19 from Chest X-Rays by building a Simple Convolution Neural Network.

- **Dataset Preparation**
- **Understanding the Dataset**
- **Building a CNN**
- **Model Training**

TABLE FOR DATASET DISTRIBUTIONS

PERSONS	TAIN	VALIDATION
NORMAL PERSON	112	30
COVID_19 INFECTED PERSON	112	30

THANK YOU