Covid-19 Detection in CT and CXR Images Using Deep Learning Models : A Review

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Abstract: *Infectious diseases pose a threat to human life and could affect the whole world in a very short time. Corona-2019 virus disease (COVID-19) is a example of such harmful diseases. COVID-19 is a pandemic of an emerging infectious disease, called coronavirus disease 2019 or COVID-19, caused by the coronavirus SARS-CoV-2, which first appeared in December 2019 in Wuhan, China, before spreading around the world on a very large scale. The continued rise in the number of positive COVID-19 cases has disrupted the health care system in many countries, creating a lot of stress for governing bodies around the world, hence the need for a rapid way to identify cases of this disease. Medical imaging is a widely accepted technique for early detection and diagnosis of the disease which includes different techniques such as Chest X-ray (CXR), Computed Tomography (CT) scan, etc. In this paper, we propose a methodology to investigate the potential of deep transfer learning in building a classifier to detect COVID-19 positive patients using CT scan and CXR images. From the results of the experiments it was found that by considering each modality separately, the VGGNet-19 model outperforms the other three models proposed by using the CT image dataset where it achieved 88.5% precision, 86% recall, 86.5% F1-score, and 87% accuracy while the refined Xception version gave the highest precision, recall, F1- score, and accuracy values which equal 98% using CXR images dataset. These results enables to automatize the process of analyzing chest CT scans and X-ray images with high accuracy and can be used in cases where RT-PCR testing and materials are limited.*

Keywords: CT (Computed tomography), PET(Positron emission tomography) ANN (Artificial Neural Network) Covid etc.

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