Diagnosis of COVID-19 Using Deep Learning and Data Augmentation from Chest CT-Scan Images

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Coronavirus disease 2019 (COVID-19) has infected more than 100 million individuals all over the world and caused more than 2.3 million deaths. There have been increasing efforts on developing deep learning methods to diagnose COVID-19 based on CT scans. In this work, the aim is to enhance the diagnosis accuracy by designing a new CNN classifier and adopting data augmentation to improve the training results. The proposed model is tested on a COVID 19-CT dataset that consists of 746 CT scan images. Results show that the proposed CNN model with data augmentation outperformed other pre-trained models such as DenseNet121, MobileNet, DenseNet169, and ResNet50. This model was able to achieve an accuracy of 94.2%, while the highest accuracy obtained by other pre-trained models is 83.4%. To simplify the use of this model and make it accessible, an online web-based tool has been developed that can provide the predicted diagnosis for any uploaded CT-scan image. This work has the potential to provide effective diagnosis tools that can help fight the spread of COVID-19.

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