COVID-19 Chest X-ray Images: Lung Segmentation and Diagnosis Using Neural Networks

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COVID-19 has caused world-wide disturbances and the deep learning community has been finding ways to combat the disease. Applications of neural networks in image processing tasks allow COVID-19 Chest X-ray images to be meaningfully processed. In this study, the V7 Darwin COVID-19 Chest X-ray Dataset is used to train a U-Net based network that performs lung-region segmentation and a convolutional neural network that performs diagnosis on Chest X-ray images. This dataset is larger than many of the datasets used to develop existing COVID-19 related neural networks. The lung segmentation network achieved an accuracy of 0.9697 on the training set and an accuracy of 0.9575, an Intersection-over-union of 0.8666, and a dice coefficient of 0.9273 on the validation set. The diagnosis network achieved an accuracy of 0.9620 on the training set and an accuracy of 0.9666 and AUC of 0.985 on the validation set?.

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