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DETECTION COVID-19 OF LUNG x-ray IMAGE USING mobilenet NEURAL NETWORK

Abstract

World Health Organization categorized Covid-19 as a pandemic (WHO). This virus was spreading direct or indirectly among people. The long timeline of PCR tests and lack of test tool kits in many hospitals lead to infection worsening according to the slow diagnosis. The Various experiences of radiologists cause deferent in accurate detection. Moreover, the detection of infection areas in the lungs is a difficult mission. The goal of this research is to detect Covid-19 infection in the lungs. The proposed system detects digital X-ray scans for Covid-19 and predicts which lungs are infected. The data was pre-processed. The pre-processing stage was applied to the data set, such normalization, and resizing. The data was also fetched from the Kaggle website, and the infected and non-infected data were manually classified. The next stage is the proposed model, where transfer learning was used as a deep learning method to detect infection architectures that were trained (MOBILENET). A system for detecting Covid-19 using digital X-ray scans was developed based on the proposed model. This system uses a depth learning transfer approach to detect infections in the lungs. Performance is improved by fine-tuning the last three layers of the MobileNet model and replacing them with two layers dedicated to binary image classification. The datasets in the first dataset "Large Digital X-ray Scan Slide Dataset" were used without a mask for the lungs. Using the uninfected dataset, the model reaches 141. The second infected 141 dataset is the "Digital X-ray Lung Segmentation and Infection Dataset". This dataset contains a lung mask to help extract lungs from images. The results obtained from the first dataset reached an accuracy of 99.7% with a training loss of 0.0085 and a validation 6 loss of 0.0162. Infection localization is not well captured using this dataset. The second dataset reached 99.72% accuracy with a training loss of 0.0104, a validation loss of 0.0048, and a testing loss of 0.0044. More images were generated: 273 for training and 118 for testing. Here I added an additional test just to increase the accuracy of the results Performance: Improving the performance of the training data leads to improving the performance of the final model when evaluating the test data, so test data was also generated Here, the processing operations were done on Google Colab, and layers were also used, and the last three layers were removed in two layers Adjust the last three layers of the MOBILENET architecture (dense layers) by replacing them with two layers (global average layer, batch_normalization layer, and binary classification dense layer). The data was pulled from Google Drive