

An intelligent classification model for Lung X-Ray using deep learning**By****Worod Radi Ibrahim Ibrahim****Supervisor****Dr. Shadi Mahmud AlZubi****Al-Zaytoonah University of Jordan, 2021****Abstract**

Recently, a global disease has emerged, the spread of which has negatively affected all levels. Initially, the epidemic was caused by a virus that spread in one of the Chinese cities and then spread around the world to become an epidemic called Covid-19, which led to large-scale losses at all levels, especially in the economic field, as well as a large number of human deaths. Countries conducted research to limit the spread of the disease and urged researchers to find ways to detect Covid-19 easily and quickly. The researcher began looking for an application design that distinguishes between lung diseases, the most important of which is Covid-19, as it is a quick and inexpensive approach to knowing and detecting this virus and other similar diseases. To be able to introduce them to the networks, the researcher used open source Kaggle and four X-ray files: Covid-19, Lung-Opacity, Normal, and Viral Pneumonia. After recalling the images, the program processes them to improve their accuracy, then the convolutional neural network detects and diagnoses the disease using MATLAB interface within the application, where four pre-trained and designed convolutional neural networks, namely CNN, VGG19, RNN-LSTM, and inceptionv3 were used from scratch. It was the first network VGG19, which had a 26% accuracy even after using the histogram equivalent, so the researcher moved to a pre-trained convolutional neural network RNN-LSTM,

which had a 25% accuracy and a 28% accuracy after using the processor, which was the start of inceptions v3 that gave better results after using the processor, reaching an accuracy of 83%, and when using the network Convolutional Neural CNN, which was designed from scratch, the results increased to 93%, and after using the histogram wizard, the results increased to 96%, which is considered the best network used and led to improved results.

Keywords: Intelligent Classification, Deep Learning, Lung disease diagnosis, Computer Aided Diagnosis.