Paper Title: Automatic COVID-19 Detection from Chest X-ray using Deep MobileNet Convolutional Neural Network

Authors: Noor Kamal Al-Qazzaz and Alaa A. Aldoori (University of Baghdad, Iraq); Sawal Hamid Md Ali (Universiti Kebangsaan Malaysia, Malaysia); Siti Anom A Ahmad (Universiti Putra Malaysia, Malaysia)

Email: noorbmemsc@gmail.com

Abstract

As the COVID-19 pandemic has put a strain on healthcare systems around the world, accurate and rapid virus detection has become increasingly important. Lung issues caused by COVID-19 can be detected using a chest X-ray (CXR). In order to automatically determine whether or not a patient's CXR data are consistent with COVID-19, this work provides a deep learning transfer learning MobileNetV2 model for constructing such a computational tool. In order to automatically learn and extract important information from CXR images, deep learning employs a Convolutional Neural Network (CNN) firstly by using pre-trained MobileNetV2 for classification. The second step was to use a support vector machine (SVM) classifier on the data gathered from the 'global average pooling2d 1' layer. When using transfer learning with deep learning (DL) pre-trained MobileNetV2 CNN model and SVM classifier, we were able to increase accuracy from 92.28% using the baseline model to 93.2%. Using a combination of MobileNetV2 features and SVM classifiers proved to be the most effective method for identifying COVID-19, non-COVID lung opacity, and normal. These findings provide credence to using deep processing algorithms to improve the discrimination of COVID-19, non-COVID, and lung opacity patients from healthy controls.