A Comprehensive Investigation of Machine Learning Feature Extraction and Classification Methods for Automated Diagnosis of COVID-19 Based on X-ray Images'

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The quick spread of the Coronavirus Disease (COVID-19) infection around the world considered a real danger for global health. The biological structure and symptoms of COVID-19 are similar to other viral chest maladies, which makes it challenging and a big issue to improve approaches for efficient identification of COVID-19 disease. In this study, an automatic prediction of COVID-19 identification is proposed to automatically discriminate between healthy and COVID-19 infected subjects in X-ray images using two successful moderns are traditional machine learning methods (e.g., artificial neural network (ANN), support vector machine (SVM), linear kernel and radial basis function (RBF), k-nearest neighbor (k-NN), Decision Tree (DT), and CN 2 rule inducer techniques) and deep learning models (e.g., MobileNets V2, ResNet50, GoogleNet, DarkNet and Xception). A large X-ray dataset has been created and developed, namely the COVID-19 vs. Normal (400 healthy cases, and 400 COVID cases). To the best of our knowledge, it is currently the largest publicly accessible COVID-19 dataset with the largest number of X-ray images of confirmed COVID-19 infection cases. Based on the results obtained from the experiments, it can be concluded that all the models performed well, deep learning models had achieved the optimum accuracy of 98.8% in ResNet50 model. In comparison, in traditional machine learning techniques, the SVM demonstrated the best result for an accuracy of 95% and RBF accuracy 94% for the prediction of coronavirus disease 2019.