

Expand AI Computer Vision Assignment

Task: Chest X-Ray images play a vital role in the diagnosis of diseases. In this assignment, you will be in-charge of the task of Chest X-Ray Classification into 3 categories Covid, Normal, and Pneumonia.

Dataset: As part of this assignment, you are provided with the Chest X-Ray dataset with one zip file having 900 images (300 images per class).

Problem-1

Fine-tune a pretrained Image Classification model of your choice by using 80% data as the training set and 20% as the test set. Please feel free to use any Fine-Tuning approach to solve this problem.

Solution:

To solve the problem 1, I have used VGG16 pretrained model which is a popular convolutional neural network (CNN) architecture commonly used for image classification tasks.

I have used VGG16 because of its some advantages which are as follows:

Simplicity and Elegance: VGG16 has a straightforward and elegant architecture.

Deep Network: VGG16 is a deep CNN with 16 weight layers, hence the name. The depth of the network allows it to learn complex features and hierarchies in images, enabling better representation learning. Deep networks like VGG16 have shown superior performance in various computer vision tasks.

Transfer Learning: VGG16 has been trained on large-scale image datasets such as ImageNet, which contains millions of labelled

images. The pre-trained weights of VGG16 can be used as a starting point for transfer learning. By leveraging the learned features from pre-training, you can achieve good performance even with limited labelled data for your specific task.

In short VGG16 is simple model that give you better accuracy when you have simple dataset like the given data (3 classes)

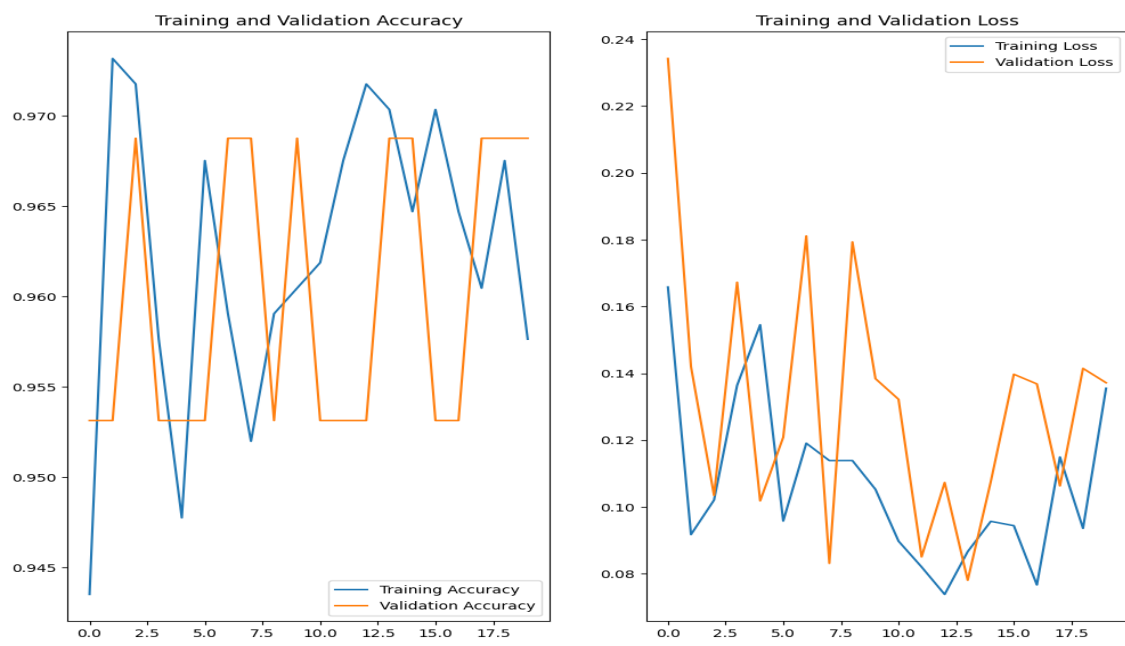
I have compared its performance with RESNET50, VGG16 has better accuracy as compared to RESENT50, even though RESNET50 is advance model than VGG16.

I am putting performance measurements below.

VGG16 multi class classification model trained on 3 classes (covid, normal and pneumonia)

Evaluation Table:

Sr. No	Accuracy	F1 (micro)	F1(macro)
1.	95.55 %	95.55 %	95.53%



Inference images with predicted and actual label and confidence

