Transfer Learning by Feature Extraction

By Using VGG16 Model (with and without Augmentation)

Transfer Learning

Transfer learning means using what we've learned from one thing to help us do another thing. It's like if you already know how to ride a bicycle, it's easier to learn how to ride a motorcycle because some skills are similar. Similarly, in machine learning, we use knowledge gained from solving one problem to help us solve a similar problem more easily. This can save time and make our models better at new tasks.

VGG16 Model

Transfer learning with VGG16 involves utilizing a pre-trained VGG16 model to extract features from images. With feature extraction, we remove the fully connected layers of VGG16 and append new layers for our task.

Augmentation

Augmentation is a technique used in machine learning, particularly in image processing tasks. It involves creating new training examples by applying various transformations to the existing training data. These transformations can include flipping, rotating, zooming, shifting, or changing the brightness and contrast of the images. The goal of augmentation is to increase the diversity of the training data, which helps improve the generalization and robustness of machine learning models.

Transfer-Learning by using VGG on Cat Dog Dataset

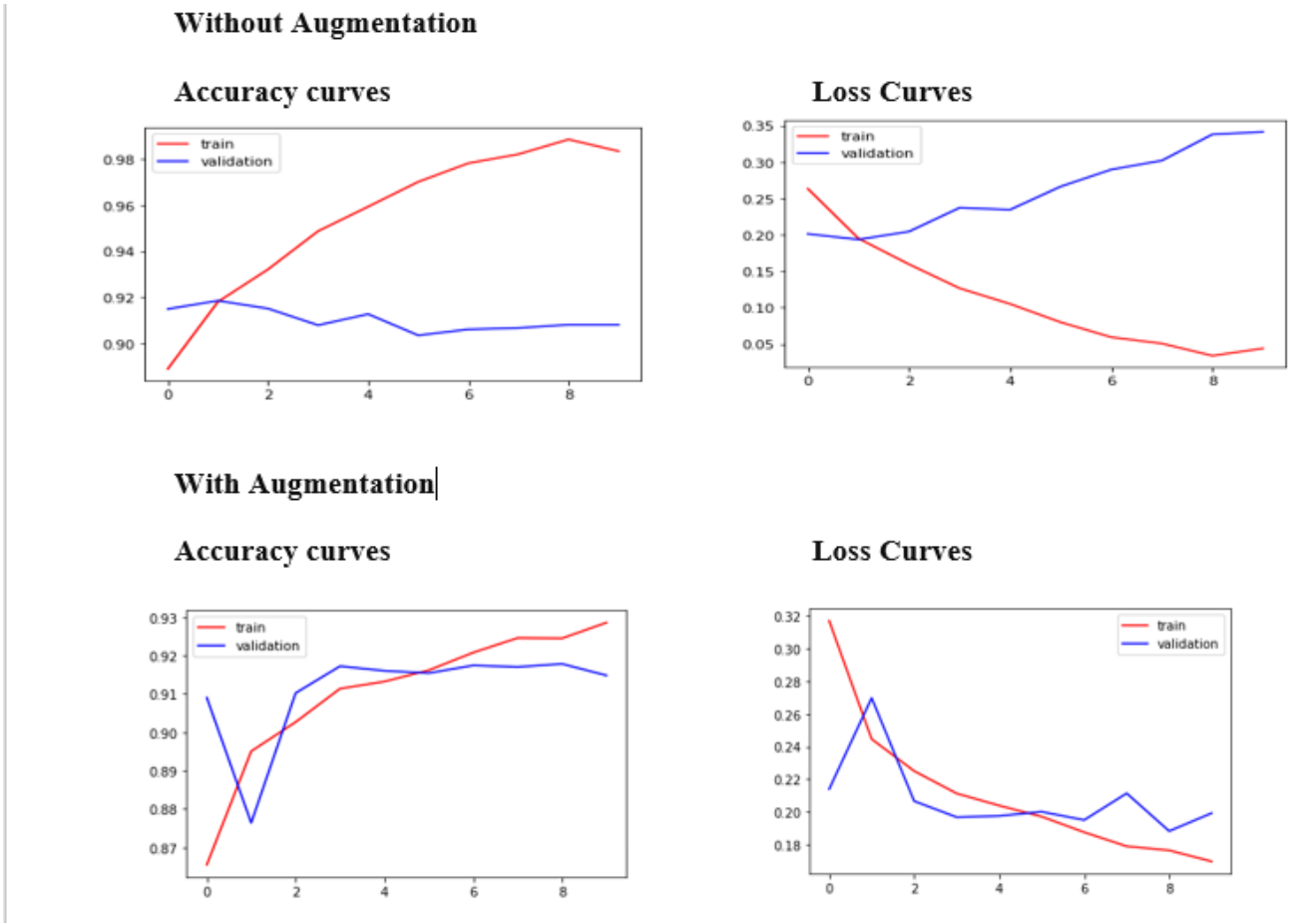
Without Augmentation

In the last epoch (Epoch 10/10), the model achieved a training loss of approximately 0.0438 and a training accuracy of approximately 98.33%. In terms of validation, the model attained a validation loss of about 0.3412 and a validation accuracy of around 90.82%.

With Augmentation

In the final epoch (Epoch 10/10), the model achieved a training loss of approximately 0.1697 and a training accuracy of approximately 92.86%. For the validation set, the model attained a loss of around 0.1993 and an accuracy of approximately 91.48%.

Keras-Plot training, validation and test set accuracy



Summary

Without Augmentation graph of the training and validation history indicates that our model is exhibiting signs of overfitting.

With Augmentation history graph indicates that after augmentation, our model fits well to the training and validation data.