

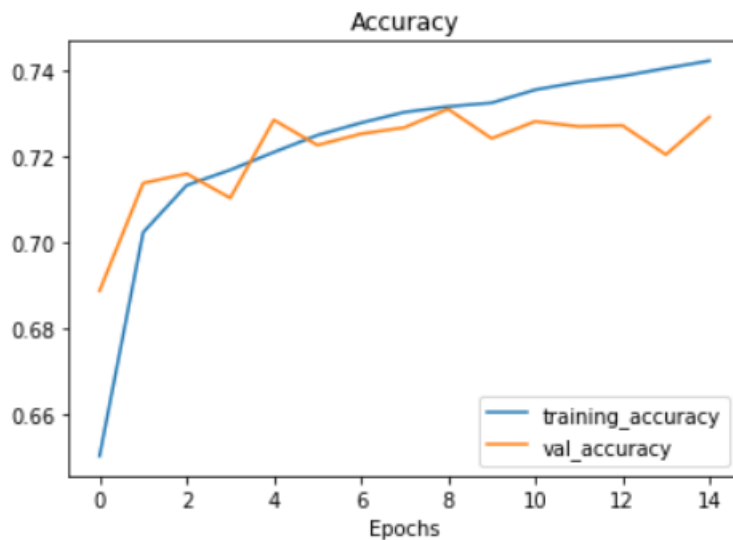
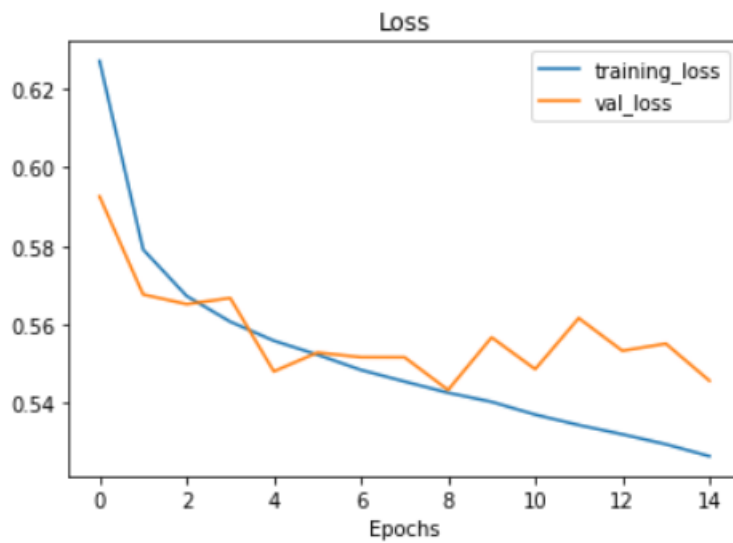
E2E Deep learning Project

Common Task 1

Classification of Electron and Photon

The given dataset of 32x32 matrices having two channels. I have used a CNN model with just 4 convolution layers and a single max pooling layer. This was done so as to incorporate as much as possible data for training as testing with more layers came at a computational cost at this amount of data.

The model was trained for over 10 epochs



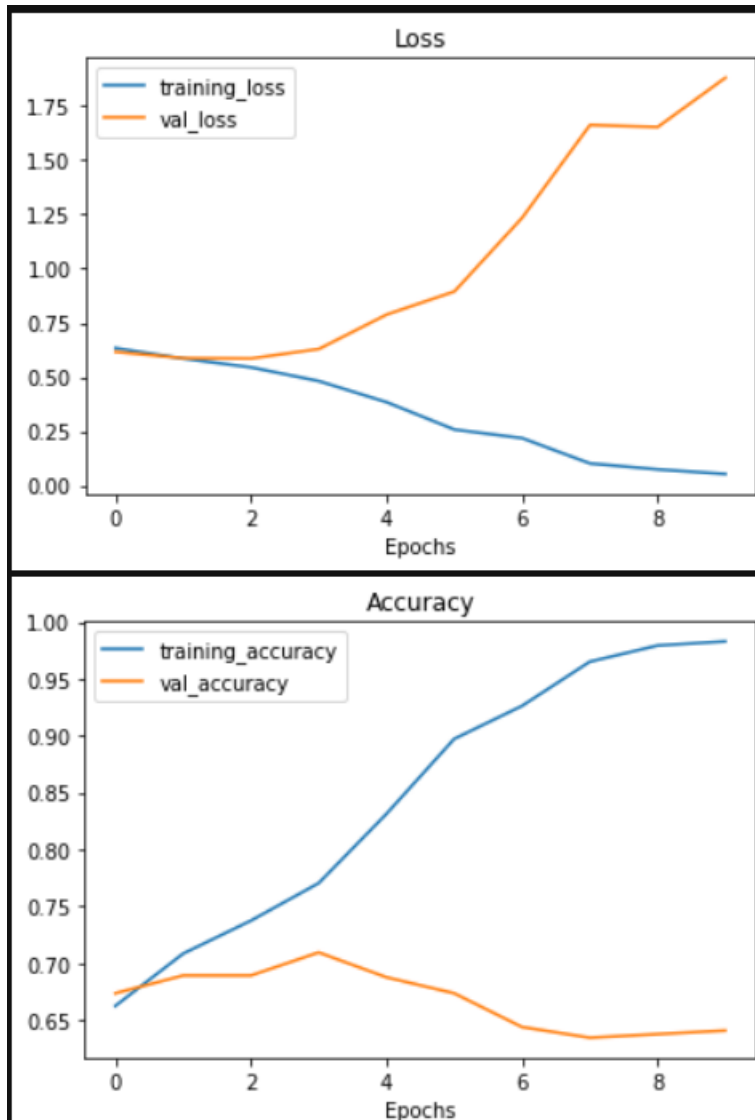
The ROC AUC score was around 79.34%. With a few more layers of convolution layers as well as getting more of the data, the ROC score can go higher.

ROC AUC: 0.7934

Task 2

Classification of Quark-Gluon

Given dataset of image array of 125x125x3. Have used a similar CNN model but with a few more convolution layers with a bit more filters, and dropout layers. The model was overfitting as seen from the graphs below. For this I have used 2 dropout layers but it's effect was not that noticeable.



Test accuracy is 64% and ROC AUC score is 69%

Task 3

Using Vision Transformers to classify electrons and photons.

The model works by dividing the image into patches and then uses self-attention mechanisms to process images.

The model I trained was unsuccessful and was guessing the data rather than predicting because it was not learning anything. The accuracy was 50%.

