

# Homework 2

Minkai Sheng

Viax - Get started with Deep Neural Networks

UNIVERSITY OF CONVENTRY

May 16, 2020

## LeNet with CIFAR10:

**learning rate: 0.001**

**network structure: 1 convolutional layer + 1 pool + 1 convolutional layer + 3 linear layer**

### Loss Result:

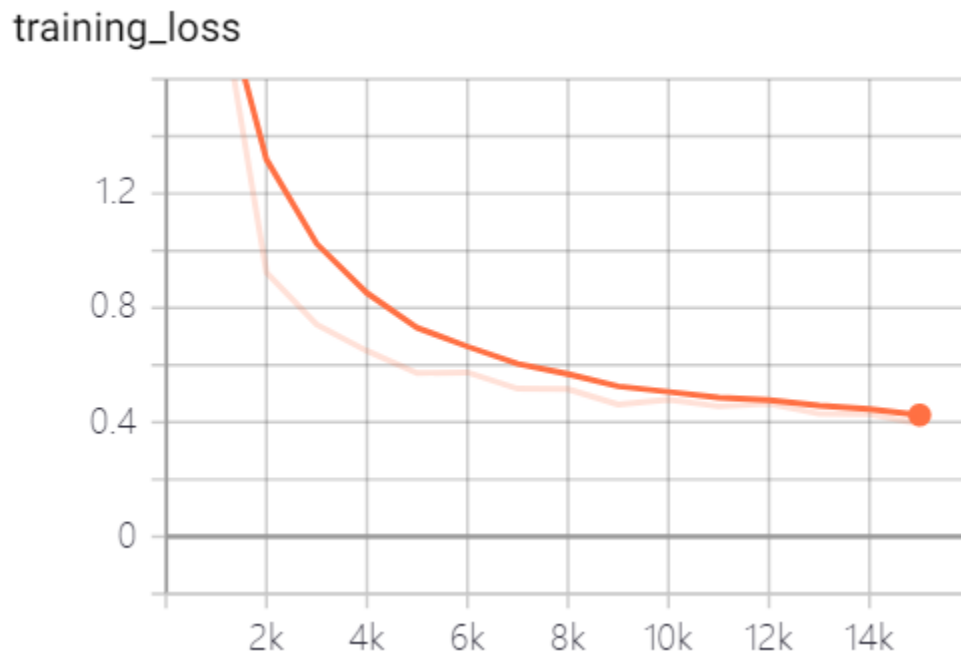
[1, 1901] loss: 2.075  
[1, 3901] loss: 1.834  
[1, 5901] loss: 1.656  
[1, 7901] loss: 1.555  
[1, 9901] loss: 1.515  
[1, 11901] loss: 1.473  
[2, 1901] loss: 1.329  
[2, 3901] loss: 1.390  
[2, 5901] loss: 1.341  
[2, 7901] loss: 1.357  
[2, 9901] loss: 1.307  
[2, 11901] loss: 1.310

### Accuracy Result:

Accuracy of the network on the 10000 test images: 54  
Accuracy of plane : 60  
Accuracy of car : 65  
Accuracy of bird : 33  
Accuracy of cat : 50  
Accuracy of deer : 51  
Accuracy of dog : 49  
Accuracy of frog : 57  
Accuracy of horse : 48  
Accuracy of ship : 68  
Accuracy of truck : 60

## Use Tensorboard to visualize LeNet

Training Loss:



## VGG-Net-16 with CIFAR10:

learning rate: 0.001

network structure: 13 convolutional layers and 3 Linear layerse

### Loss Result:

[1, 1901] loss: 2.083  
[1, 3901] loss: 1.797  
[1, 5901] loss: 1.577  
[1, 7901] loss: 1.442  
[1, 9901] loss: 1.317  
[1, 11901] loss: 1.207  
[2, 1901] loss: 1.021  
[2, 3901] loss: 1.009  
[2, 5901] loss: 0.975  
[2, 7901] loss: 0.929  
[2, 9901] loss: 0.879  
[2, 11901] loss: 0.850

### Accuracy Result:

Accuracy of the network on the 10000 test images: 72

Accuracy of plane : 77

Accuracy of car : 81  
Accuracy of bird : 62  
Accuracy of cat : 58  
Accuracy of deer : 78  
Accuracy of dog : 50  
Accuracy of frog : 75  
Accuracy of horse : 76  
Accuracy of ship : 81  
Accuracy of truck : 86

**Analyze the results** Sturcture of VGG-NET-16 is much more complex than LENET, as expected the accuracy is also higher(54%-72%). In my experiment the first running result of VGG-NET-16 is awful which the accuracy of few kinds are euqual to zero, so i try the second times, i still doesn't figure it out.