Deep Learning homework: 1/6

❖ Train a traditional 2 hidden layers + last FC layer network on the CIFAR 100 train set (layers parameters provided)

❖ Parameters: 256 batch size, 20 epochs, 32x32 resolution, Adam solver with learning rate 0.0001

❖ At each epoch calculate and store the accuracy of the current network on the test set

❖ Plot the training loss and the calculated accuracy curves

❖ Write your comment about the final accuracy. Did you expect it? Try to make an hypothesis on that behaviour.

Deep Learning homework: 2/6

❖ Train the simple CNN architecture provided on the CIFAR 100 train set

❖ Parameters: the same of 1/6.

❖ At each epoch calculate and store the accuracy of the current network on the test set

❖ Plot the training loss and the calculated accuracy curves

❖ Write your comment about the final accuracy. Did you expect it? Why?

Deep Learning homework: 3/6

❖ Repeat 2/4 step but change the number of convolutional filters from 32/32/32/64 to 128/128/128/256, 256/256/256/512, 512/512/512/1024 (**slow training**)

❖ Parameters: the same of 1/6.

❖ Plot the training loss and the calculated accuracy curves

❖ Write your comment about the final accuracy. Any particular behaviour?Try to make an hypothesis on it. What about computational time?

Deep Learning homework: 4/6

❖ Start from the network with 128/128/128/256 filters, repeat 2/4 analysis but do the following modifications:

❖ 4a) Batch Normalization (*every convolutional layer)*

❖ 4b) BN + FC1 wider (8192 neurons)

❖ 4c) BN + Dropout 0.5 on FC1 (4096 neurons)

❖ Parameters: the same of 1/6.

❖ Plot the training loss and the calculated accuracy curves

❖ Write your comment about the final accuracy. Any particular behaviour?Try to make an hypothesis on it.

Deep Learning homework: 5/6

❖ Start from the network with 128/128/128/256 filters, repeat 2/4 analysis but with the following data augmentation: 4a) Random horizontal flipping; 4b) random crop

❖ Parameters: the same of 1/6. To do random crop, resize to 40x40 and do random crop 32x32.

❖ Plot the training loss and the calculated accuracy curves

❖ Write your comment about the final accuracy. Any particular behaviour?Try to make an hypothesis on it.

Deep Learning homework: 6/6

❖ Load ResNet18 pretrained on ImageNet and finetune it on our CIFAR 100 training set as usual. (**slow training**)

❖ Parameters: 128 batch size, 10 epochs, 224x224 resolution, Adam solver with learning rate 0.0001.

❖ Use the best data augmentation schema found in previous step.

❖ Plot the training loss and the calculated accuracy curves

❖ Write your comment about the final accuracy. Any particular behaviour?Compare with previous results and try to make an hypothesis on it.