



ASSIGNMENT NO. 3

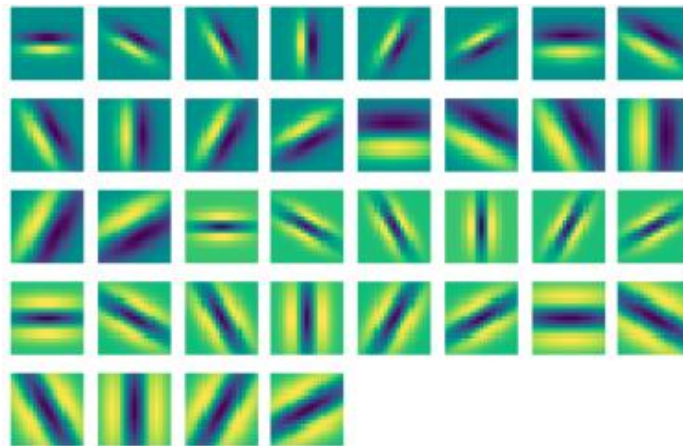
Deep Learning

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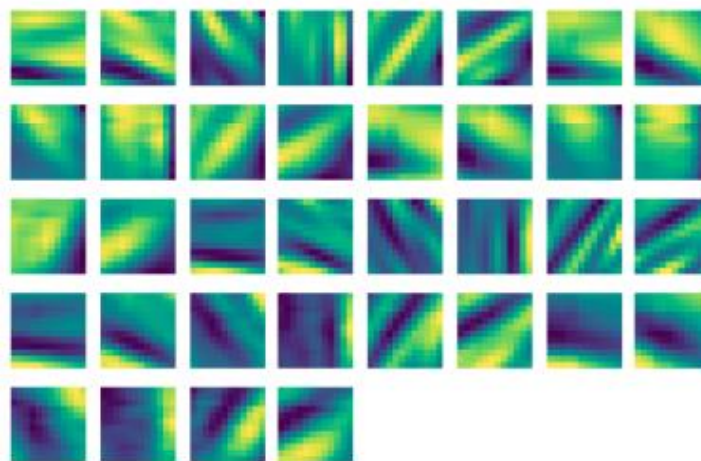
Assignment 3 Report

Convolutional neural networks are used for feature extraction from the set of image. CNN are very similar to the ordinary neural network as we made in assignment 2.

In this task firstly we are given with the 36 filters which are 17x17 dimensional and will be used to detect 36 number of changes in an image like; gradient filter along x-axis or y-axis. Here are the representation of filters that we have used.

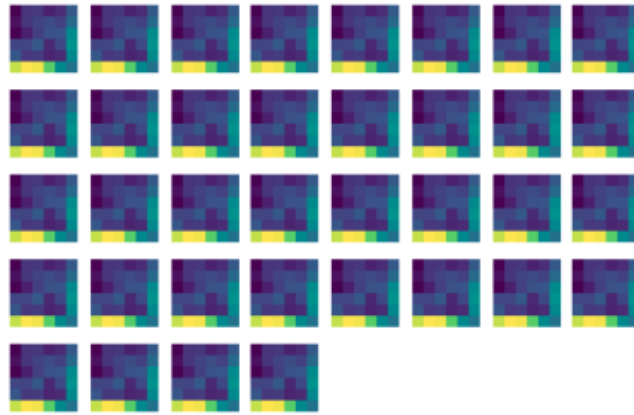


In CNN firstly we have to implement convolution function in which I, implement a single step of convolution, in which you apply the filter to a single position of the input. This will be used to build a convolutional unit, which Takes an input volume, Applies a filter at every position of the input and Outputs another volume (usually of different size). Here are the sample of the feature map created after first convolutional layer.



After performing convolution, we normally do pooling operation which can be max or average pooling with main purpose to reduce the dimension of data which help in using less computation

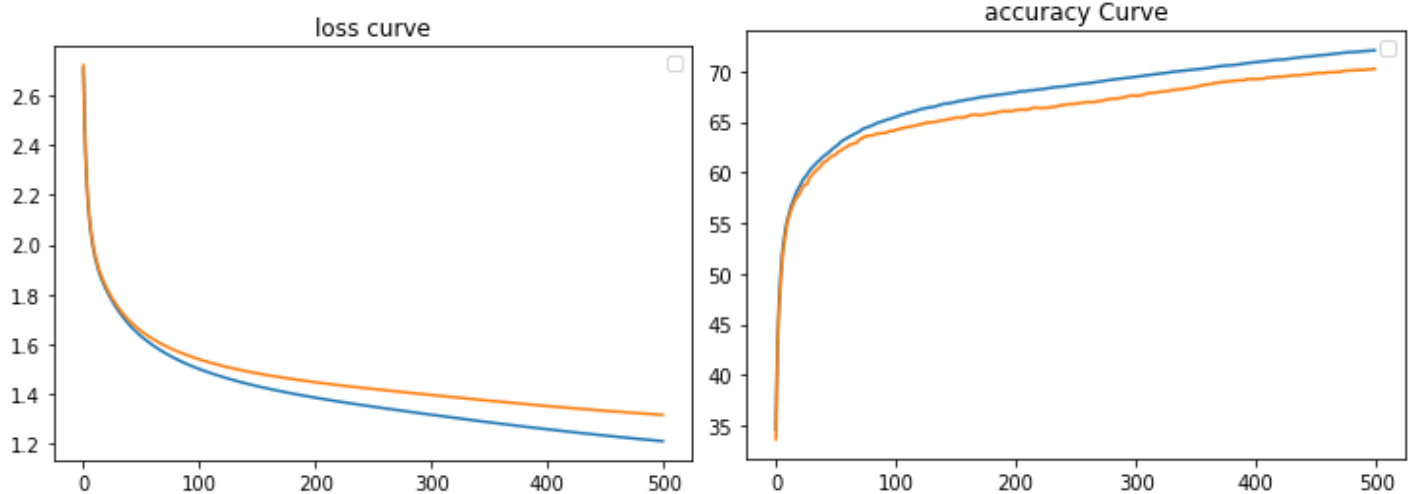
power. In both of these steps we have to first calculate the dimension of the output value and then we execute our width and height loop with condition on output dimension. This methodology helps us to carry out controlled operation. After pooling the output is somehow like:



The number of neurons used on hidden and output layers are 128, 64 and 10. The results we get are somehow like this.

Results on 500 epochs.

Train accuracy = 72.04% and Testing Accuracy = 70.47%



The number of neuron used on hidden and output layers are 128,64 and 10. The results we get are somehow like this.

Results on 400 epochs and 0.2 learning rate.

Train accuracy = 72.36% and Testing Accuracy = 70.5%

