Deep Learning: Lab 5

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1 A simple CNN baseline

An initial CNN model was built as described in the instructions. Since this is a regression task for a line of best fit, the mean squared error was used as our loss function. The results were as follows:

Training loss: 1.75, **Validation loss:** 32.62

Notice that our validation loss was significantly higher than our training loss, suggesting that our model was overfitting to the given data. This may be because of how shallow the network is, using only a single convolutional layer.

2 A Simple CNN with global pooling

We will continue to use mean squared error in this section. A new CNN was built as instructed and the results were as follows:

Training loss: 11.49, **Validation loss:** 17.43

Although our training loss increased compared to Question 1, our validation loss decreased, suggesting that our improved model no longer overfits. This model performs significantly better than our previous one

3 Let's regress

Training loss: 2.49, **Validation loss:** 4.74

Compared to Question 2, we have significantly decreased both our training loss and validation loss.

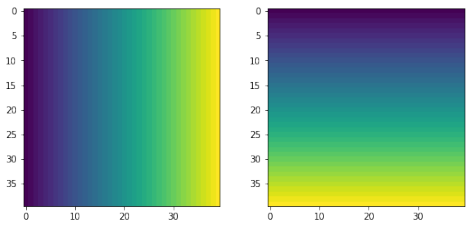

Figure 1: Graphs of the two extra channels added to each training instance.

The modification adds two channels to each training instance - each channel consists of numbers ranging from $-1/2$ to $1/2$ in equal increasing intervals, as shown in Figure 1.