EXERCISE 3 COMPUTER VISION

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The task was the extension to the encoder that was given in the previous exercise. In this task our main objective to construct a decoder following the encoder.

Basically we had four convolution layers described by the "inverted bottle_neck" function which was responsible for the forward convolution.In our decoder we had to implement transpose convolution functions besides the upsampling functions .

Our main task revolved around the 4 configurations as described.

The first task was an absolute upsampling from the base layer.

Second task consisted of a skip connection with upsampling. Skip connections are used to pass information on to the lower layers such that minute details are better classified.The reason is the due to information is lose as we pass along the layers and at the end due ti many layers the information becomes distorted to interpret.With the skip connections our losses decrease and we can have a more accurate output.

Third task consisted of two skip connections

Fourth configuration consisted of three skip connections.

With an increase in skip connections the accuracy becomes better and the system is able to predict the labels better.

First the training data was run to save all the checkpoints.Test data was run after that to use the model path to train the model.The resuts were saved in the IoU text file with IOU representing(intersection over union) with respect to the iterations.

Iteration vs epochs

In the code it is stated that there are 500 steps to epoch and the total number of iterations we have are 40 as given in the text file.

The following graphs were drawn with iterations on the x axis and IoU on the y axis.

Results

The results are as following. The data was drawn on excel but there are also epoch files in each configuration to directly extract the data from the textfile.

Final analysis

Test IoU vs # Iteration

- Configuration 1
- Configuration 2
- Configuration 3
- Configuration 4