CSC321 Assignment 2

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February 27, 2018

A

1

It has 5 Convolutional Layer.

Conv	Number of filters	Filter size
downconv1	num_filters	kernel
downconv2	num_filters*2	kernel
rfconv	num_filters*2	kernel
upconv1	num_filters	kernel
upconv2	3	kernel
finalconv	3	kernel

2

The result doesn't look very good. Most of them are not colored correctly. And only 3 of them colored correctly for the main part and still have some problem in the colorization of body. And the image is like some single colored.

3

Since green light and blue light are closer, so for incorrect colorization for red light it will give higher loss.

4

Using regression would make each layer intend to output an average value to minimize the cost. Which is not what we want. Also, notice that some some

colors might closer but they looks more different than some colors that are relatively far from each other. (I.E. Suppose the correct color on the pixel is (0, 0, 0) which is balck. Then (0, 100, 0) is like green whereas (100, 100, 100) is like grey. Even though (0, 100, 0) is closer to (0, 0, 0), but using (100, 100, 100) looks more reasonable.

B

2

It is better than the previous one. It actually have more colors if we compare with the regression one. The regression one looks all yellow.

C

3

I don't train for 25 epochs, I use the weight from weights folder, The output looks better than CNN's output. At least the performance on Validation set is better, like around 8% better. It actually colored more detail compare with CNN, and of course, due to it colors more details, sometimes it colors some unnecessary details which fail to predict the correct colorization.

D

1

a

It has 9 weights, receptive field size to the previous layer: 9

b

It has 25 weights, receptive field size to the previous layer: 25

c

It has 9 weights, receptive field size to the previous layer: 49

2

I think it because dilation actually exponentially increase the receptive field size without changing the weight size. Since the contiguous pixel are somehow connected, using dilation can reduce the loss of resolution compared with adding another layer. Whereas if we add another convolution, it has more weights to calculate, and probably need more zero padding.

E

1

The first few layers have clearer image compared with later layers. I can actually recognize some objects in the first few layers especially the output of first layer however the output of later layers are full of mosaic.

2

In the later layers, especially second last layer, it has clearer contour than output in the same layer in CNN. In the third last layer, it is darker than output in the same layer in CNN.

F

1

Augmenting via flipping each image left to right would be helpful. Because it is flip the input and make sense to recognize them as the same object in most cases. Depending on the cases, augmenting via flipping each image upside down might also be helpful, the reason is same as above, but sometimes it doesn't make sense since flip object up and down might change the object.

2

Kernel size, number of filters, number of classified colors, learning rate, epoches.