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Homework 3

Pytorch version: 1.0.1.post2

Epoch = 6,
Learning rate: 0.001,
Optimizer: stochastic gradient descent
Batch size: 4

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Accuracy of the network on the 10000 test images: 66 %  
Accuracy of plane : 73 %  
Accuracy of car : 83 %  
Accuracy of bird : 47 %  
Accuracy of cat : 43 %  
Accuracy of deer : 65 %  
Accuracy of dog : 50 %  
Accuracy of frog : 75 %  
Accuracy of horse : 66 %  
Accuracy of ship : 81 %  
Accuracy of truck : 77 %
```

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Success Overlap  
result/OTB2013/DCFNet_test(0.5254)
```

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OTB2013 Best: result/OTB2013/DCFNet_test(0.5254)
```

The neural network uses a forward pass to first predict the classification. Calculated the loss between the forward output and the actual output. Then do backward propagation to update the gradient of the kernel weight of each layers. The higher the classification accuracy, the better $\phi(x)$ feature map we get for the DCF tracker.

The DCF tracker uses gradient descent. With each sample selected, the update method updates the accumulated filter W by using fast Fourier transform. Then in the forward method, we move on to the next image by assuming the new image has patch x at the same location of the old image. Then do reverse fast Fourier transform with the accumulated filter W to calculate the maximum response location of the feature map of the new image. Then the new optimal patch x is obtained to the next update forward loops.