Convolutional Neural Networks

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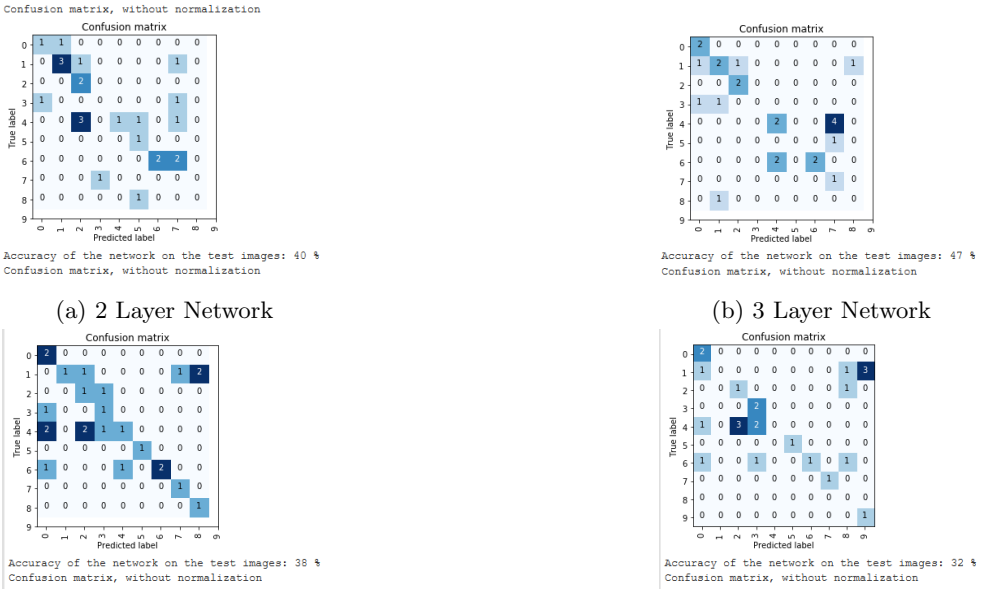
Contents

0.1 Part I: Experimenting with Features

Firstly, for my experiments, I have tested various number of layers to see how it affects the performance of the network. I have also decided to validate the performance of different filter size's of the two proceeding convolutional layers. These are the confusion matrices that I have generated for different layers:



(a) 2 Layer Network

(b) 3 Layer Network

(c) 4 Layer Network

(d) 5 Layer Network

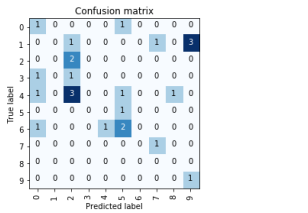
Figure 1: Confusion Matrices for the Different Layers

As you can see, the layers perform better with a lower number of layers, the sweet spot being around 3.

0.2 Part II: Visualising Filters

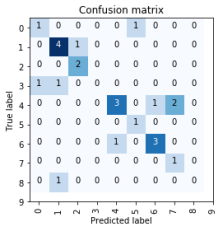
0.3 Part III: Visualising Features

0.4 Part IV: Experimenting with Network



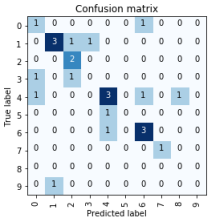
Accuracy of the network on the test images: 43 %
Confusion matrix, without normalization

(a) 2 Filter Size Network



Accuracy of the network on the test images: 48 %
Confusion matrix, without normalization

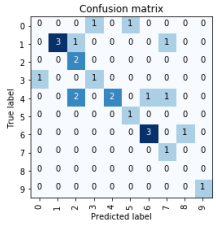
(b) 3 Filter Size Network



Accuracy of the network on the test images: 49 %
Confusion matrix, without normalization

(c) 4 Filter Size Network

Confusion matrix, without normalization



Accuracy of the network on the test images: 47 %

(d) 5 Filter Size Network

Figure 2: Confusion Matrices for the Different Layers