## 

My Network Designs

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| *Network Layout* | |
| ***Network 1*** | ***Network 2*** |
| *conv 3x3x32-s-2* | *conv 5x5x32-s-2* |
| *ReLu* | *ReLu* |
| *maxpool 2x2-s-1* | *maxpool 2x2-s-2* |
| *conv 5x5x64-s-2* | *conv 3x3x64-s-1* |
| *ReLu* | *ReLu* |
| *maxpool 4x4-s-1* | *maxpool 2x2-s-1* |
| *fc* | *fc* |
| *fc* | *fc* |

*table according to my parameter choices.*

Training Description

*I get the first 9000 of dataset for training and 1000 dataset for testing of MNIST dataset. And down sample the original 28x28 data set to 14x14 and also augmented the 14x14 dataset to 14x14 dataset, another expression I used 3 type of different dataset to training, the number of all dataset for training is 36000.*

*I repeated my training 20 time to get more accuracy, that called epoch. I declare epoch as a parameter of method you can test with variety of epoches to see the effect of epoch to increasing accuracy.*

*Here I used with epoch 20 to get more accuracy.*

Data Augmentation

*In my data augmentation I used translation, scales and rotation as I show in the code. I create augmented data equal size of the original data and in this case we had 9000 original dataset and 9000 augmented dataset I mixed them together and get 18000 dataset.*

Experimental Results

*My experimental results.*

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| --- | --- | --- |
| *Experimental Results* | *Performance in %* | |
| ***Data Set*** | ***Network 1*** | ***Network 2*** |
| 28x28\_dataset | 97.8 | 97.6 |
| 14x14\_dataset | 96.7 | 94.7 |
| 14x14\_augmented\_dataset | 95.8 | 93.9 |

Discussion

*In the original 28x28\_Dataset I get more accuracy than others. In the augmented dataset dispute of the more dataset number but I get less accuracy, because my distortion was very high and the images convert so different from original images, this make going up covariance and make to accuracy is going to down.*

*In network2 our kernels size are 5x5 and this help to grasp local features better than network1 which uses a 3x3 kernel size, and also by decreasing stride size we will get better results.*