

Assignment 3

GitHub repo:

<https://github.com/toastedphil/cs4347assignment3>

Details of Architecture:

I used a 4 layer convolution neural network for my project similar to the one you gave us for the project. I added a few “batch normalization” layers to normalize the input layers to hopefully get better results. I also switched the optimizer to Adam.

Results of Experiment:

```
(assign3) PS C:\Users\Philip Arturo Cesani\Desktop\ml_assign3\CS4347-master\assign3_convolution_nn> python kerasmain1014conlayers.py
Using TensorFlow backend.
Found 10000 images belonging to 10 classes.
Found 10000 images belonging to 10 classes.
2019-12-03 03:25:14.781669: I tensorflow/core/platform/cpu_feature_guard.cc:142] Your CPU supports instructions that this TensorFlow binary was not compiled to use: AVX2
Epoch 1/10
1/100 [.....] - ETA: 34:35 - loss: 3.8748 - accuracy: 0.07002019-12-03 03:25:45.252639: I tensorflow/core/profiler/lib/profiler_session.cc:184] Profiler session started.
100/100 [=====] - 2092s 21s/step - loss: 2.5563 - accuracy: 0.2565 - val_loss: 11.3767 - val_accuracy: 0.1022
Epoch 2/10
100/100 [=====] - 1546s 15s/step - loss: 2.0115 - accuracy: 0.3450 - val_loss: 9.7949 - val_accuracy: 0.1108
Epoch 3/10
100/100 [=====] - 941s 9s/step - loss: 1.8389 - accuracy: 0.3876 - val_loss: 10.2079 - val_accuracy: 0.1290
Epoch 4/10
100/100 [=====] - 922s 9s/step - loss: 1.7026 - accuracy: 0.4188 - val_loss: 16.7717 - val_accuracy: 0.1164
Epoch 5/10
100/100 [=====] - 923s 9s/step - loss: 1.6479 - accuracy: 0.4325 - val_loss: 4.7120 - val_accuracy: 0.1650
Epoch 6/10
100/100 [=====] - 917s 9s/step - loss: 1.5782 - accuracy: 0.4490 - val_loss: 5.2650 - val_accuracy: 0.2037
Epoch 7/10
100/100 [=====] - 917s 9s/step - loss: 1.5002 - accuracy: 0.4762 - val_loss: 6.2927 - val_accuracy: 0.2215
Epoch 8/10
100/100 [=====] - 916s 9s/step - loss: 1.4419 - accuracy: 0.4914 - val_loss: 3.4455 - val_accuracy: 0.3360
Epoch 9/10
100/100 [=====] - 914s 9s/step - loss: 1.3995 - accuracy: 0.5096 - val_loss: 12.0333 - val_accuracy: 0.2562
Epoch 10/10
100/100 [=====] - 916s 9s/step - loss: 1.3757 - accuracy: 0.5202 - val_loss: 10.2803 - val_accuracy: 0.2612
(assign3) PS C:\Users\Philip Arturo Cesani\Desktop\ml_assign3\CS4347-master\assign3_convolution_nn>
```

Used in Experiment:

Loss Function: Cross Entropy

Learning Rate: .001

No Scheduler Used

Optimizer: Adam

Epoch: 10

Train Size: 100

Test Size: 100

Data Dimension Height x Width: 128 x 128