Lukas Fu Homework 2

Classification Challenge

```
1
2  [xTrain, tTrain, xValid, tValid, xTest, tTest] = LoadMNIST(3);
3
4  layers = [
5      imageInputLayer([28 28 1])
6
7      convolution2dLayer(3,20,'Padding',1,'WeightsInitializer','narrow-normal','
           BiasInitializer','narrow-normal')
8      batchNormalizationLayer
9      reluLayer
10
11     maxPooling2dLayer(2,'Stride',2)
12
13     convolution2dLayer(3,30,'Padding',1,'WeightsInitializer','narrow-normal','
           BiasInitializer','narrow-normal')
14     batchNormalizationLayer
15     reluLayer
16
17     maxPooling2dLayer(2,'Stride',2)
18
19     convolution2dLayer(3,50,'Padding',1,'WeightsInitializer','narrow-normal','
           BiasInitializer','narrow-normal')
20     batchNormalizationLayer
21     reluLayer
22
23     fullyConnectedLayer(10,'WeightsInitializer','narrow-normal','
           BiasInitializer','narrow-normal')
24     softmaxLayer
25     classificationLayer
26 ];
27
28 options = trainingOptions('sgdm', ...
29     'Momentum',0.9, ...
30     'MinibatchSize',8192, ...
31     'InitialLearnRate',0.01, ...
32     'MaxEpochs',30, ...
33     'Shuffle','every-epoch', ...
34     'ValidationData',{xValid, tValid}, ...
35     'ValidationFrequency',30, ...
36     'ValidationPatience',5, ...
37     'L2Regularization', 0, ...
38     'Plots','training-progress');
39
```

```
net = trainNetwork(xTrain,tTrain,layers,options);
xTest2 = loadmnist2();
predtTest2 = net.classify(xTest2);
predtTest2 = cast(predtTest2,'uint8')-1;
%writematrix(predtTest2,'classifications.csv')
```