6000B Deep Learning Assignment 2

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In this project, we need to process the image data and classify the given images into 5 classes.

* Data processing

In order to process many image data stored in different folders, we can't read all the image at the same time as we did before. What we can do is to use the path information provided in the txt files. I chose the python package named skimage to process and read the images data.

Besides, the shapes of our images are totally different, which led to a problem to solve. The input of neural network should be in the same shape, so I tried to reshape the image into 64 times 64. This process also saved our time to run the program and build our model.

* Neural network modeling

I used tensorflow structure to build my own neural network model. In this problem, I just tried to use one fully connected layer to build the back-propagation network. The input of my model is every 64 times 64 times 3 high-dimensional matrices provided in the training set. Each dimension of those matrices stands for the RGB value of each point.

For the hidden layer, I put 30 neurons to connect the input layer and the output layer because we have only 5 classes to categorize, which means that the output layer only contains 5 values. In order to balance the number of input and output layers, I chose to put 30 neurons.

I used 500 iterations to minimize the loss function. The loss function is chosen to be cross entropy in my model.

* Metric

The metric I use in the problem is simply accuracy, which represents the proportion of correctly classified images. The accuracy in the validation data can reach over 40 percent.