

Assignment #6: TensorFlow Lab 2

For this lab we will be working through the human/horses example of using convolutional neural networks. **Feel free to review the material in Moroney chapter 3 if it is helpful.**

Task 1:

- Download the lab2.zip file from the website. It has some source code to get you started.
- Extract the files from the zip file into a lab2 project folder.
- [local machine only] install scipy (and pillow?) using pip if necessary

Task 2 (local machine):

- Run cnnDemo3.py in order to download the training and validation images for this lab.
- Verify using the Windows Explorer that the downloads created the correct directory structure and placed the files where they belong.
- Run cnnDemo4.py to display a sample of the images in a new window.

Task 2 (Colab):

- From cnnDemo3.ipynb run the first code segment in order to download the training and validation images for this lab.
- Click the folder icon in the sidebar (see image in the right margin) to verify that the downloads created the correct directory structure and placed the files where they belong.
- Run the second code segment to display a sample of the images in a new window.



Task 3:

- Run cnnDemo5.py or the third code segment of cnnDemo3.ipynb to build and train a CNN with both training and validation being performed for each epoch.
- Collect the accuracy and val-accuracy data from all 15 epochs and use either Excel or Python to plot these values over time (accuracy is the y-axis, and epoch is the x-axis).
- Interpret these results and draw some conclusions (i.e., write a few sentences that explain what you are seeing any why you think that is).

Task 4:

- Now make a few changes to cnnDemo4.py or the second code segment in cnnDemo3.ipynb so that it displays images from the validation directory rather than the test directory.
- Does what you see confirm or deny the hypotheses and conclusions that you drew in Task 3?

Task 5:

- Copy and paste the code found in `cnnDemo6.py` to the bottom of your `cnnDemo5.py` or into a new code segment in `cnnDemo3.ipynb`.
- Collect some pictures of humans and horses of your own in the same directory.
- Run this new version of `cnnDemo5.py` or the new code segment. When prompted with a file open dialog box select one of your files. Your file will be classified in the terminal window. Continue to select more files to be tested. When you are out of test files, click cancel in the dialog box.
- How did the model do on these test files? Summarize what you think is going on.

Turn in your answers to the questions in this lab via email by Friday, October 11.