Homework 5

CS 4710

Due: Day of Final Exam @11:59PM EDT

Note: This assignment has only a single problem.

Problem 1: Image Classification

Your goal in this assignment is "simple" (at least to describe): you must build a classifier capable of performing image recognition, according to the spec described below. Be on the lookout for an email with a (hopefully) useful set of links.

Classes

Your classifier will be expected to work with the following image classes:

1. Dog
2. Cat
3. Baseball bat
4. Cricket bat
5. Car
6. Truck

Input Data

Input will be jpg format images. In training your classifier, **you will be responsible for finding your own input data.** There are plenty of free datasets of the web; I will link to a few in the email that will go out about HW5.

Expected Deliverable

You must submit in one of the following two formats:

1. A file in **pb** format (stores trained model)
2. A python script capable of performing the classification (if you choose to go non-neural network) – if you go this direction, make sure (a) your program can take an image directory path as a command line argument, and (b) is runnable as a standalone program

I will be scoring your classifier's accuracy by testing against my own dataset. This dataset will not be released – its purpose is to test your out-of-training-set (validation) accuracy. Your classifier's score is **not** your grade. I will be grading as usual.

Avoiding Overfitting

To do well on this assignment (in terms of validation accuracy), you should test your own classifier's ability to predict out-of-dataset (on examples it hasn't seen during training). To accomplish this, set a segment of your dataset (10 percent, say) and use that as a benchmark. It won't perfectly predict how it'll do on the set I'll use, but it'll help you see if your accuracy is attributable to overfitting.

Hint

Training an image classifier from scratch can be time-consuming. Consider using the *bottleneck* technique discussed in class (tutorial for bottlenecking in Keras included in HW5 email). This allows for:

1. Much quicker training times (modern laptops can train in a few minutes)
2. Requires a lot less data than training from scratch (for comparable accuracy)

If you have any questions at all, don't hesitate to ask – office hours work the best.

GOOD LUCK!