ECE763 Project 02

Due 04/06/2018

How to submit your solutions: put your reports (word or pdf) and results images (.png, if had) in a folder named *[your_unityid]_project01* (e.g., twu19_project02), and then compress it as a **zip** file (e.g., twu19_project02.zip). Submit the zip file through **moodle**.

Importance of working on Project 02 individually: Getting hands-on experience is important, which benefits you the most if you play with it individually and independently.

Objectives: Face image classification using a simple neural network to get familiar with steps of training neural networks.

Data Preparation (Reuse your data in project-01, but you need to extract more examples). Prepare training and testing data. Go to https://github.com/betars/Face-Resources and select one of the provided 17 face datasets which has face bounding boxes annotated. Download the dataset (note that some of the 17 datasets might need registration to download and you can skip those to save time). Extract $n = 10{,}000$ training images (**or more, you can combine multiple datasets**) for face and non-face respectively, and $m = 1000$ testing images for face and non-face respectively, both at 60×60 resolution (resizing accordingly). Make sure training face images and testing face images are separate, that is no face testing images are from the same person in the training set of face images. And, non-face images should be cropped randomly from background in the provided images in the dataset you selected.

Method: Practice the babysitting method of training neural network as discussed in Lecture 17 (slide 61-slide 80)

Step 1: preprocess the data. (Note: you can compare w/ and w/o this preprocessing step to see how it affect your training and testing performance)

Step 2: Choose the architecture. E.g. you can use something simple as in slide 62 or the LeNet 5.

Then please follow the slides to output detailed information of this babysitting procedure.

Hint: You can reuse the tutorial code in different deep learning platform (e.g., the MNIST tutorial is available in almost all platforms).

- E.g., If you use tensorflow, you can build on top of the code for MNIST example. https://www.tensorflow.org/tutorials/layers

Requirement: Although you can reuse the tutorial code, you need to modify the code to output different babysitting information. You need to snap your screenshots and paste those in your reports as shown in the slides. You also need to provide **self-contained code (in project 01 some of the submitted codes are not self-contained)**.