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COMS 402C Report

Goals and Objectives:

This course is really special and different than any other courses I have been taken. The few reasons are that it’s a senior design course and is for the students who is going to graduate. Also, this course contains two different major’s students, they group and work together like we will do in our future career. I am really confused with my goals for this course at the beginning of the semester, since there’s no data given to me that I can analyze like in traditional. But after joining with a group and clear with our app ideas, I started having my goals for this class in my mind. I will be mainly focusing on the image recognition part that can help my group creating for the app features. In addition, I plan to find some dataset about sleeping time and quality to analyze it.

Basic about Image Recognition:

Image Recognition is the ability of software to identify objects in images. It’s hard for a machine to recognize image like human being do, we need to train them, and they need to learn from it. We will used pre-label images which contains image itself and label to train model with machine learning algorithm. Since the machine couldn’t directly understand one normal image, it will need to extract one image into lots of pixels, and each pixel is represented as a number or set of numbers, that number will decide the depth of color. After finish training the model, we need to test the model by fit in a new image to the model, and the model will be using algorithm to predict the label for that image, and then we can find out how accurate this model is. More training data given to the model; more accurate the model will be.

A brown and white dog looking at the camera

Description automatically generated

A brown and white dog looking at the camera

Description automatically generated A black and white tiled floor

Description automatically generated A close up of a piece of paper

Description automatically generated

Gather the data and own experience:

I have used two datasets for my handwriting experiments, one is the sklearn dataset, the other is the dataset from Kaggle website. Using Kaggle dataset as an example, it contains train.csv and test.csv. There are 42000 rows and 758 columns for the dataset. These data are images which will show different hand-drawn digits from zero through nine, and it is gray-scale image which means the image only contain black and white color. In the dataset, each image is total of 784 pixels, which 28 pixels in height and 28 pixels in width. Each pixel represents a value that range from 0 – 255, higher the number means darker the color.

I firstly find and load this dataset, then shuffle the data and randomly choose sample form the dataset as training set and the remaining as testing set. Training set is used for training the model, testing set is used for testing the model. In handwriting example, each data contains digit image itself and the corresponding label, image shows the feature, and label shows that image’s category, like an image with circle shape, that label is called zero. There are lot of algorithms we can use in image recognition such as support vector machine, decision tree or convolutional neural network. When finish train our model, we will use testing set to test our model, given one of the data in testing set to the model, the model will predict its corresponding label base on what they are learning from training set. We are also able to calculate the accuracy for that model.