Machine Learning II

Prof.Jafari

Jue Wang, Tianyi Wang, Yina Bao

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Group Project Proposal

• Dataset

This data has two formats: One is the original images with character level bounding boxes, and the other one is MNIST-like 32-by-32 color images centered around a single character. In this project, we are going to use the 32-by-32 color images that all images are resized to the fixed resolutions. The dataset has ten classes, one for each digit. Digit '0' has label 0, '9' has label 9.

In the dataset, they separate data into two groups: 73257 digits for training and 26032 digits for testing. There also have 531131 additional data to use as extra training data.

Dataset Link: http://ufldl.stanford.edu/housenumbers/

• The problem definition and motivation

By giving pixel value vectors as features, we leverage ten classification models to predict the label of images. In this project, we aimed at applying various machine learning including deep learning techniques in order to do the image classification. The models respectively are Multilayer Perceptron Networks (MLP), Convolutional Neural Network (CNN) and Caffe. Though these different models, we can also find out how these algorithms compare to each other and how can we improve our model.

• The proposed method and reference materials

In our project, our team plans to implement the image classification using the aforementioned algorithms. We are going to compare the MLP model with different layers convolutional neural network models. Regarding the accuracy and efficiency based on the performance of the models to be evaluated, and we are optimizing different models in each scenario by tuning the algorithms. The models that we are going to apply can be found in the textbook: Neural Network Design.

Schedule for completing the project:

Date	To Do
10/29 ~ 11/3	Gather datasets; import dataset
11/4 ~ 11/10	Build the MLP model
11/11 ~ 11/17	Build the CNN models
11/18 ~ 11/24	Improve accuracy
11/25 ~ 12/1	Write the final report
12/4	Presentation