NN, Spring 2017 大學部 Proj #4: Multilayer Perceptron on Real Data

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何時給 project: April 26, 2017.　　何時交 project: June 6, 2017　　遲交不收，抄襲 0 分。

In multilayer perceptron model, use gradient descent method to solve the real data problem in MNIST.

打 keywords: mnist database 或 直 接到 MNIST 的網頁 http://yann.lecun.com/exdb/mnist/。

The MNIST database of handwritten digits has a training set of 60,000 examples, and a test set of 10,000 examples. 選取 5000 個 examples 做 training，2000 個做 testing 即可。

For the problem:
Describe parameters of your network: number of hidden layers, number of hidden nodes, learning rate parameter (η), stop criterion, …, etc.
Plot the figure of average error vs. iteration,
Plot the decision region. Recognition rate and CPU time.

寫 MATLAB program 不要用 function，用自己寫的程式做實驗。

Discussion (10%)

How to determine the hidden node number in each problem? Describe in detail. Describe any phenomenon you watched, any try to explain it if possible.

Any experiment like changing learning rate parameter, designing more layers, determining the hidden node number, or adding momentum term is greatly encouraged. 需要用到 high order inputs?

References

要交的東西:

(1) 在指定日的上課前，交紙本報告 (包含敘述如何做，flowchart，結果，討論，參考文獻，及 Matlab programs).

(2) 將要交紙本報告的 doc file 及分開的 MATLAB program file 建成一個 directory (資料夾)，壓縮成 rar 檔後，上傳到 e3 system.

Directory name 的名稱: Proj#4_姓名_NN_2017_Spring。