Neural Network for Recognizing Handwritten Numbers

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As spoken with Mrs. Lars, I have changed my Project 3 to a neural network instead of the minesweeper problem.

The code is written in C++ and uses OpenCV to read the handwritten images. The package includes the source file, some images used to train the neural network and the makefile. The OpenCV is used exclusively to open the .PNG image and to show it in the graphical user interface. All the data manipulation is done by the algorithm.

When run, it will perform an automatic fast learn step (will take less than 10 seconds) with few samples of handwritten digits. It would be good to have more samples and more time for this step but I'm trying to keep it fast to test. Before finishing the learning step it will ask to the user if the images are learned correctly, for this step the user has to give feedback about 10 images that the neural network will guess (this is the demonstration that the algorithm works). For the last step it will allow the user to draw in the blank box a number. It may get the incorrect result for the very first tries since it will be different from the test sets, but after some tries it will answer correctly.

By doing this project I've learned more about how a neural network actually work and the problems related to it. It gave me a nice knowledge about how and when can I use this. It also let me work with OpenCV, images and mouse input for drawing.

How to run the code:

In it's root folder, write: make
Then: ./main

GCC supporting C++ 11, OpenCV and Linux may be required. Tried to run it on Windows without success(Had problems installing the OpenCV on Windows).