

Supplementary material - "Learning the Distance to a Set and an Improved Nearest Neighbour Classifier"

The folder contains the following two MATLAB programs:

1. Program "Wnn"

The program calculates squared Euclidean distances to the 10 classes on each of the 784 windows of size 11 (it is possible to vary the window size by changing the parameter "K" in Section 2 of the program). The program uses 50000 images (images with numbers 1-5000 for each digit) as a training set and 10000 images (images 5001-6000 for each digit) as a test set. The result is saved as the matrix W11_65 which depends on 4 parameters (the first parameter "i" is changing from 1 to 10000 (i - number identifying the test image), the second parameter "j" is changing from 1 to 10 (j - the number of the class to which we calculate the distance), the third and fourth parameters "s1" and "s2" are the coordinates of the center of the window (changing from 1 to 28 each). Section 3 of the program calculates the number of misclassified test images and display it on the screen.

2. Program "Ann"

The program uses neural networks to approximate the matrix W11_65 (see above). Weights and biases of these neural networks are applied to 10000 test images (for this program the test images are the images with numbers greater than 6000 for each digit). The result of this program is the matrix A11_75 which has the same structure as W11_65 (only the set of test images are different). As for "Wnn", the number of misclassified test images are displayed on the screen.