Machine Learning

Homework 2

Adaline algorithm

(Deadline. Feb 11, 23:59)

Problem 1 *(40 points, hand-written)*

You need to fit a binary classifier using the AdalineGD Algorithm on randomly generated data. Take the data generated for the first problem of Homework 1 and apply the algorithm **(manually, not in code)** including the details of all the steps (net input calculations, activation function outputs, parameter updates, etc.).

Stop after 4 iterations, make predictions and discuss the results.

Problem 2 *(40 points, coding)*

Implement the AdalineMiniBatch algorithm where the batch size needs to be provided as an argument during the class initialization. If there is no sufficient number of data points for the last batch, just take what is left.

Train a classification model on the Iris dataset (same setup as in the provided lecture code) and compare the results with the models trained with AdalineGD and AdalineSGD.

Feel free to utilize the lecture codes.

Problem 3 *(20 points, hand-written)*

Answer the following questions:

1) Is it always a good idea to stop the training of Adaline as soon as no data points are misclassified? Explain your reasoning.
2) Does the batch size matter when training an AdalineMiniBatch classifier (not taking in account the computational resource utilization)? Explain your reasoning.