University of Fribourg
Departement of Informatics

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Spring Semester

Pattern Recognition

Exercise 2b - March 23, 2020

First Team Task (MLP)

Deadline: April 6, 2020 (end of day)

With this exercise you should use your framework for applying an MLP approach to the MNIST dataset.

The goal of this exercise is to train an MLP with one hidden layer and experiment with different parameters.

Reminder: From now on you are free to either implement algorithms on your own or use any kinds of libraries.

MLP

Use the provided training set to train an MLP with one hidden layer. Apply the trained MLP to classify the test set. Perform validation with the following parameters:

- Optimize number of neurons in the hidden layer (typically in the range [10, 100]).
- Optimize learning rate (typically in the range [0.001, 0.1]).
- Optimize number of training iterations. Plot a graph showing the error on the training set and the validation set, respectively, with respect to the training epochs.
- Perform the random initialization several times and choose the best network during validation.

Expected Output

- Access to your GitHub so that we can inspect your code.
- Small report in PDF / README format on the GitHub containing:
  - Plot showing the accuracy and loss on the training and the validation set with respect to the training epochs.
  - Test accuracy with the best parameters found during validation.