University of Fribourg
Departement of Informatics

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Spring Semester 2019 Pattern Recognition

Exercise 2c - March 25, 2019

First Team Task (CNN)

Deadline: April 8, 2019 (end of day)

In this exercise, you should train and test a basic CNN on the MNIST dataset.

We recommend you use the DeepDIVA framework, which is build on top of PyTorch.

Use the incomplete CNN implementation that you find on ILIAS (model_task2c.py).

Note: You can also use DeepDIVA for task 2b (MLP). See today's exercise slides for details.

DeepDIVA:

- homepage: https://diva-dia.github.io/DeepDIVAweb/index.html
- getting started: https://diva-dia.github.io/DeepDIVAweb/getting-started.html
- tutorial: https://diva-dia.github.io/DeepDIVAweb/articles.html
- code https://github.com/DIVA-DIA/DeepDIVA
- visualization: https://diva-dia.github.io/DeepDIVAweb/articles/visualize-results/

CNN

Complete the provided CNN implementation. Use the provided training set to train a CNN. Apply the trained CNN to classify the test set. Perform validation:

- Optimize learning rate (typically in the range [0.001, 0.1]).
- Optimize number of training iterations. Plot a graph showing the accuracy 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.
- 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.