Case 0. Learning basics

Applications of Neural Networks in Medicine

Type

Individual work, 5 p

Aim

In this assignment, you should learn to:

- use the notebooks
- use basic Tensorflow neural network functions
- document the results clearly and in an easily readable format using Markdown cells in the notebook.

Task

You should try to find **as simple a neural network model as possible** that you are able to train **in as small a few epochs as possible** to classify the black and white handwritten digits**.**

- Find the provided template "Case 0. Learning basics (Template)" in Kaggle or in Colab.
- Copy the template and rename the notebook by removing "(Template)" from its name.
    - Remember also to change the title of the notebook!
- Add your name and date to the title section of the notebook.
- By trial and error, find and report
    - the simplest neural network model (= smallest number of hidden layers and neurons), and
    - the smallest number of training epochs to achieve test set accuracy of 0.970.

  Don't overdo it: keep the model as simple as possible, and only train for as many epochs as necessary.
- Document the notebook by deleting the instructions and replacing them with your own notes.
- In the "Discussion and Conclusions" section, write which kind of models you have tried and tested and what your best results were.
- Finally:
    - Save the modified version of the notebook and check that there are no errors.
    - Upload the notebook in OMA assignments.

Submission

Your notebook in OMA assignments as attachment.

Assessment

The following topics are considered in assessing your notebook:

- Organization
    - The code proceeds logically, and the code cells are in proper order
    - The document has a clear structure
- Clarity
    - The document is clear, polished, and easy to understand
    - The code follows good coding practices and is adequately commented
    - The document supports the code
- Contents
    - The introduction and dataset are well explained
    - The results are reasonable
    - The conclusions are clearly stated and in line with the results

Max. 5 points. Late submission reduces the maximum achievable points.

Materials

- TensorFlow 2 quickstart for beginners | TensorFlow Core
- Basic classification: Classify images of clothing | TensorFlow Core
- How to decide the number of hidden layers and nodes in a hidden layer? | ResearchGate question
- How to determine the correct number of epoch during neural network training? | ResearchGate question