Notes from hyperparameters tuning

Performance measure: percentage of correctly classified samples.

Performance value for the default hyperparameter values (A1 = 4, A2 = 4, B = 1): **<u>92.48</u>**

Results for **grid search**, where the values of parameters A1, A2, B were selected from the following set: {0.1, 1.0, 10.0, 100.0, 1000.0}:
      the best result (performance = **95.62**) was achieved for **A1 = 1, A2 = 1, B = 0.1**.

For the random search method, where the values of parameters A1, A2, B were randomized from the following ranges (the values were established based on the results for grid search):
- for A1 and A2: <0, 10> with step 1;
- for B: <0, 1> with step 0.1;
the results are as follows:

```
Results summary
Results in hyperparameters_search_results/QNN
Showing 10 best trials
<keras_tuner.engine.objective.Objective object at
0x7f7a89dc4490>
Trial summary
Hyperparameters:
A_1: 0
A_2: 0
B: 0.0
Score: 0.0
Trial summary
Hyperparameters:
A_1: 4
A_2: 4
B: 0.7000000000000001
Score: 0.0
Trial summary
Hyperparameters:
A_1: 2
A_2: 4
B: 0.1
Score: 0.0
```
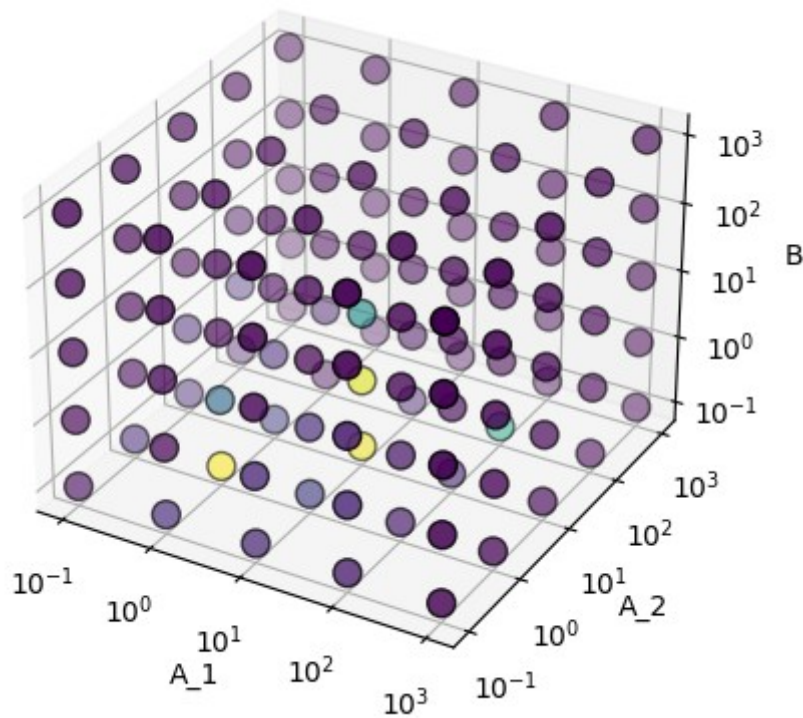
Visualization of hyperparameter tuning results using the grid search method (script `visualization.py`)[1]:

Visualization of hyperparameter tuning results (using the Keras Tuner library) with the Tensor Board tool:

1. Execute the `hyperparameters_keras_tuner.py` script
2. Run the command:
   `tensorboard --logdir = /tmp/tb_logs`
   (the path to the log directory is defined as a constant in the script).
3. In the web browser go to the address http://localhost:6006/ (or another, depending on the message received after starting TensorBoard).

---

1 The darker the dot, the greater the accuracy of the results.

TensorBoard

SCALARS   GRAPHS   HPARAMS   TIME SERIES

☐ Show data download links

☑ Ignore outliers in chart scaling

Tooltip sorting method: default ▼

Smoothing

●━━━━━━━━ 0,6 ⇅

Horizontal Axis

STEP   RELATIVE   WALL

Runs

Write a regex to filter runs

☑ ◯ 0/execution0
☑ ◯ 0/execution0/train
☑ ◯ 0/execution1
☑ ◯ 0/execution1/train
☑ ◯ 0/execution2
☑ ◯ 0/execution2/train
☑ ◯ 1/execution0
☑ ◯ 1/execution0/train
☑ ◯ 1/execution1
☑ ◯ 1/execution1/train
☑ ◯ 1/execution2
☑ ◯ 1/execution2/train
☑ ◯ 2/execution0
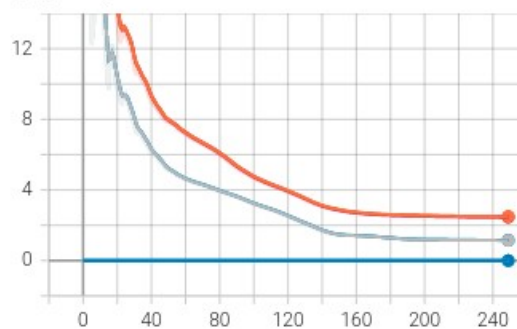☑ ◯ 2/execution0/train

TOGGLE ALL RUNS

/tmp/tb_logs

🔍 Filter tags (regular expressions supported)

epoch_loss

epoch_loss
tag: epoch_loss
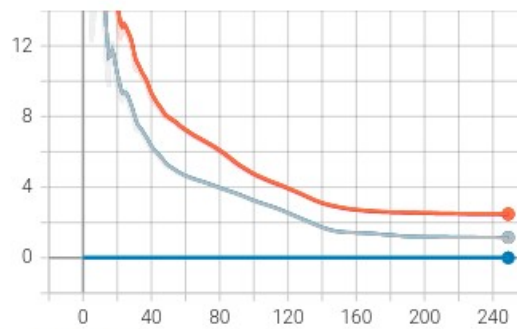
epoch_qffnn_1_loss

epoch_qffnn_1_loss
tag: epoch_qffnn_1_loss

epoch_qffnn_1_mean_absolute_error

epoch_qffnn_loss