

Marked exercises, lecture 3

This is the second set of marked exercises, which are a part of Submission 1. In this assignment, you will get familiar with several loss and activation functions. Detailed instructions and explanations are provided in the accompanying Jupyter notebook. In total, you can get 15 points out of 60 points for Submission 1 for completing all exercises related to lecture 2.

Augmentation

1.3.1 [1 point] Data augmentation on the balanced dataset. Application of various augmentation techniques to the dataset to improve performance and decrease overfitting. The task includes finding a suitable combination of data transformations.

1.3.2 [2 points] Data augmentation on the balanced dataset. Application of various augmentation techniques to the dataset to degrade the performance. The task includes finding a suitable combination of various data transformations, and stating the reason for performance degradation.

Weighted sampler

1.3.3 [7 points] Construct and use a weighted sampler on the imbalanced dataset.

Weighted Cross-Entropy loss

1.3.4 [5 points] Construct a weighted cross-entropy loss function to mitigate the imbalance of the dataset. Train the model with this function and analyse the results. The loss should reflect the frequency of appearance of each class, giving less weight to common classes to improve balance.

You ARE NOT ALLOWED to USE torch functions or toolboxes that automatically solve the main tasks of the assignment, which is specified in the.ipynb.