Neural Networks and Deep Learning

Cracow University of Technology

Lab Assignment 2:

Task: Implementation of Gradient Descent for training a simple one-layer neural network

Define the Sigmoid activation function.

Define loss function as the squared differences between predicted and ground truth.

Define derivative of activation function.

Define derivative of loss function.

Train the network:

1- Take an example and feed it to the network.
2- Calculate its gradient.
3- Update the weights using the calculated gradient.

Repeat the above steps for all the examples.

This approach is called Stochastic Gradient Descent.

```
data=    [[0.08, 0.72, 1.0],
          [0.01, 1.00, 0.0],
          [0.26, 0.58, 1.0],
          [0.35, 0.95, 0.0],
          [0.45, 0.15, 1.0],
          [0.60, 0.30, 1.0],
          [0.70, 0.65, 0.0],
          [0.92, 0.45, 0.0]]


weights = [1.00, -1.00]
```

```
bias = 0.20
```