

Semantic Computing

Tutorial 9

Summer Semester 2018

Today in this tutorial we will continue our introduction into TensorFlow. Please download the files in “tutorial9” from the github <http://github.com/dgromann/SemanticComputing/>.

Exercise 1

tutorial9_1.py: MNIST classification as regression task in tensorflow

Please first read the exercise and look at the code before you run it.

- a) Create the output variable Y to be used during training. Which variables do you need to use to define the shape of this tensor?
- b) Choose and specify an optimizer with a predefined learning rate. Which optimizer did you choose and how did it perform?
- c) Experiment with the learning rate. Which one gives you the best accuracy on the validation set?
- d) Add a second layer to the network. Keep in mind that you need to connect it correctly to layer 1 and the output layer. Does a second layer improve the accuracy of your model?

Exercise 2

tutorial9_2.py: MNIST classification as GRU implementation in tensorflow

Please first read the exercise and look at the code before you run it.

- a) Compare the two implementations as regression task from tutorial9_1 and here as LSTM implementation.
 - What is the main difference?
 - Which model performs faster?
 - Which model performs better on the test set?
- b) Change the implementation from the GRU to an LSTM using *BasicLSTMCell* and specify a *forget_bias* = 0.8 as a parameter of the cell initialization. Which one performs better?
- c) Experiment with the forget bias of the LSTM. Remember 1.0 means nothing is "forgotten" - no dropout. Which forget bias provides the best solution?