

LSTM and NLP-based Sentence and Text Classification

Submit Assignment

Due Apr 29 by 8:59pm **Points** 30 **Submitting** a file upload

Available Apr 17 at 9pm - May 4 at 8:59pm 17 days

Tasks

Develop a Long short-term Memory (LSTM) network for one of the tasks from the previous assignment. You can use for example Keras.

See:

Hochreiter & Schmidhuber (1997). "Long short-term memory". Neural Computation. 9 (8): 1735–1780. doi:10.1162/neco.1997.9.8.1735.

As an example, you might want to consider Shi et al.'s LSTM approach to Query Classification:

<https://aclweb.org/anthology/N/N16/N16-1176.pdf> [\(https://aclweb.org/anthology/N/N16/N16-1176.pdf\)](https://aclweb.org/anthology/N/N16/N16-1176.pdf)

If you want to experiment with advanced approaches using hierarchical attention networks as described in e.g. Yang et al.:

<https://www.cs.cmu.edu/~diyi/docs/naacl16.pdf> [\(https://www.cs.cmu.edu/~diyi/docs/naacl16.pdf\)](https://www.cs.cmu.edu/~diyi/docs/naacl16.pdf)

The tasks in the previous assignment were:

a. Text Classification

Movie review data:

<http://www.cs.cornell.edu/people/pabo/movie-review-data/>

If you want to use some alternative data set for this task, feel free to do so, but document it.

Describe your

- architecture and implementation
- training procedure
- evaluation methods and results

There are numerous tutorials online:

<https://github.com/oxford-cs-deepnlp-2017/lectures>

There are numerous examples and tutorials online how to use Keras and LSTM networks for this task.

b. Sentence Level Classification

The CNN-based classification task that we used in the previous assignment:

Use for example Yoon Kim's approach for a CNN-based sentence level classification approach:

Yoon Kim (2014) Convolutional Neural Networks for Sentence Classification

<https://arxiv.org/abs/1408.5882>

You might want to use some of these data sets:

- Stanford Sentiment Treebank (<https://nlp.stanford.edu/sentiment/code.html>)
- https://github.com/AcademichSinicaNLP/sentiment_dataset

You could use for example Shi et al.'s LSTM approach to Query Classification for this task:

<https://aclweb.org/anthology/N/N16/N16-1176.pdf> (<https://aclweb.org/anthology/N/N16/N16-1176.pdf>)

Train an LSTM for sentence level classification and evaluate your results.

Compare this to the results from the previous assignment.

c. Extending the approaches

Describe ways how you could extend the models using NLP to enrich the features (input vectors) and evaluate one method. (Here the idea would be to extend simple input based on word embeddings with distributional or NLP-based feature sets.)