



Active Deep Learning for Natural Language Processing

Motivation

Recently, deep learning gained much popularity. However, deep learning methods suffer from data sparsity – especially in NLP, where data is often cost-intensive to label. While active incremental learning approaches cope with this, they are not very well explored for deep learning models and most previous work has been done on convolutional neural networks for computer vision tasks. Furthermore, there is still only little support for such methods in the most common deep learning libraries.

The goal of this thesis is to develop an active learning extension for a popular deep learning framework, such as Keras or Tensorflow, and compare different strategies for a natural language learning task.

Task Description

- Explore different strategies how to apply incremental / active learning in deep neural networks
- Find a good way to update deep neural networks with a continuous stream of data
- Evaluate the viability of the approach on real-world data with second language learners.

References

- Settles B. (2010). *Active Learning Literature Survey*. (Computer Sciences Technical Report) University of Wisconsin, Madison
- Mandel T., Liu Y., Brunskill E., Popović Z.. (2017). *Where to Add Actions in Human-in-the-Loop Reinforcement Learning*. AAAI Conference on Artificial Intelligence, San Francisco, California

Contact

Analysis ■■■■□
Programming ■■■■□
Literature ■■■□□

Prof. Dr. Iryna Gurevych
Dr. Christian M. Meyer
Ji-Ung Lee

thesis@ukp.informatik.tu-darmstadt.de