

DL4NLP - Assignment 3: CNNs

Total points: 50

Due date: November 15

1 Assignment Goal

In this assignment, you will train and evaluate CNN models, on the task of predicting the sentiment of a short text.

2 Dataset

Please use the same dataset as for assignment 2.

3 Tasks

Implement CNN models for the sentiment classification task using the architecture proposed by Kim, Y. (2014), as shown in Figure 1. Use the sentiment analysis dataset to train and evaluate the models, as described below.

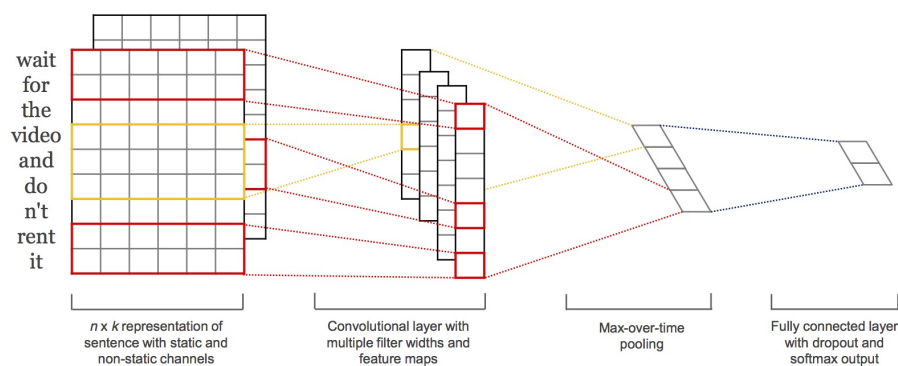


Figure 1: CNN architecture (Kim, 2014)

1. Experiment with three models corresponding to three different ways to handle word embeddings:
 - **CNN-rand.** In the first model, the word embeddings are randomly initialized and then modified during training.
 - **CNN-static.** In the second model, use the pre-trained GloVe embeddings as input and keep them fixed during training and only learn the other parameters of the model.
 - **CNN-non-static.** In the third model, use the pre-trained GloVe embeddings, but fine-tune them during training.

For each model, use a size of 300 for the word embeddings. For GloVe, use the pre-trained embeddings on Wikipedia 2014 + Gigaword 5 (the file glove.6B.zip from <https://nlp.stanford.edu/projects/glove/>).

For each model, visualize the evolution of loss and accuracy for both the training and validation sets. Which model performs better?

For other hyperparameters, use those from Kim (2014) (<https://www.aclweb.org/anthology/D14-1181.pdf>).

2. **Evaluate the models:** Evaluate the best model on the test data. Use precision, recall, and F1-measure to report the performance on the test set.

4 What to submit

Submit a Jupiter Notebook containing your code and results/plots, or python code together with a report file showing the results obtained for different tasks.