

## **CMP 670 - Statistical Natural Language Processing**

### **Assignment 3 – A Neural Language Model with a Feedforward Network Using DyNet**

(Due date: 16.05.2019 – 11:59 pm)

Similar to the first assignment you did at the beginning of the term, you will build a language model, but this time a neural language model in this assignment. In the first assignment, you built a count-based language model. In this assignment, you will build a prediction-based neural language model.

Your neural language model will be based on a feedforward network with one hidden layer. For each given word, your model will predict the next word as a bigram language model. Therefore, it is a word-based neural language model. Draw the architecture of your feedforward network by providing the computation graph equations in your report.

Once you train the neural language model, generate 5 random sentences.

Compare your results with the results you obtained from the first assignment. Do your results improve with the neural language model?

Make sure that you read Bengio et al. (2003) for the architecture details.

#### **Bonus points (+ 15 points)**

If you want to play with your neural language model further, this time convert your feedforward network into a character based neural language model, where you will predict a character based on the previous character. You can try with larger n-grams. Draw the architecture of your feedforward network in your report and describe the details.

Again generate some sentences using your character based language model. Compare the generated sentences with the word-based model and write your observations in your report.

#### **References**

Bengio et al. A Neural Probabilistic Language Model, Journal of Machine Learning Research, 2003.