



Deep Learning for Natural Language Processing

Welcome to the course

Marco Kuhlmann and Richard Johansson



Teachers





What is natural language processing?

- In a nutshell: in NLP, we build automatic systems that analyse or generate human language
- Applications range from “simple” tools such as grammar checkers and spam filters to “intelligent” systems such as translators and summarizers



Why this course?

- Along with computer vision, NLP is one of the areas in AI most affected by the shift to deep learning
- Compared to other areas, language is challenging to work with and requires specialized solutions
- Language isn't "just data"



Goals

- Some familiarity with the state of the art in NLP
- Understanding modern research papers in this field
- Practical experience of implementing some of the well-known models



Scope

- Research perspective
- Approaches based on deep learning
- Written text
- Supervised tasks
- Practical NLP and system-building



Course webpage

- All material and all information will be published on the course webpage:

<https://github.com/liu-nlp/dl4nlp>

- Announcements will be sent out on the mailing list



Teaching

- Recorded video lectures
- Exercise sessions over Zoom



Structure of the course

- The course is divided into three modules
- Each module contains a number of lectures, some exercises and one programming assignment



Module 1: Representation and categorization

- We introduce the building blocks that we use to build representations in NLP
- On the application side, we focus on text categorization tasks
- Assignment: word sense disambiguation



Module 2: Structured prediction tasks

- We present neural architectures for NLP applications that produce complex outputs
- Applications such as named entity recognition, relation extraction, syntactic and semantic parsing
- Assignment: dependency parsing



Module 3: Generation tasks, research outlook

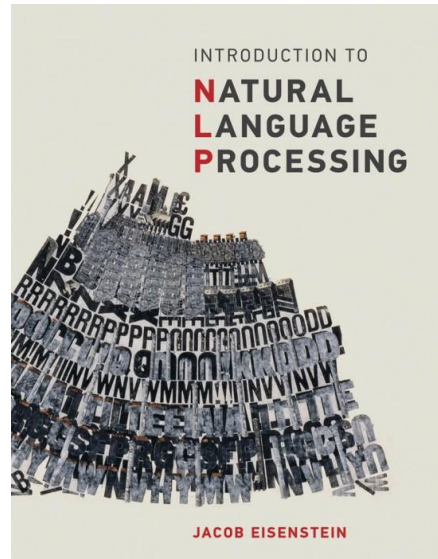
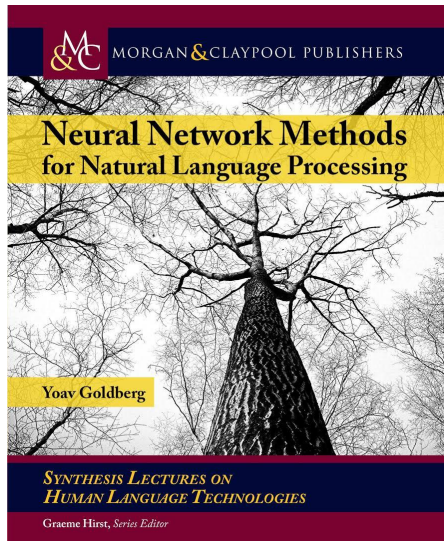
- The final module focuses on NLP applications that generate text, such as translators and summarizers
- We also discuss some recent research trends
- Assignment: your own project



Requirements to pass the course

- For the assignments: high-quality code, well-written documentation (we recommend to use notebooks)
- For the project: oral project pitch, well-written project report (think: short paper)

Literature





Jupyter notebooks

- There are Jupyter notebooks that show the implementation of what we present in the lectures
- Please go through these notebooks on your own!



Working with GPUs and Colab

- Most code examples and your assignment solutions will need a GPU to run reasonably efficiently
- If you don't have a GPU machine at your university, you can use the free Colaboratory (colab) service



Before you start

- Make sure you understand the basics of machine learning, and neural networks in particular
- Make sure you know how to work with notebooks
- Install PyTorch and make sure that you can run some small code examples



The remainder of this module

- Watch the capsule introduction to NLP, linked from the course website
- Join us for the first exercise tomorrow!



Next meeting

- Exercise session tomorrow at 10:15–12:00
- Topic of the exercise: basic text processing
- The other exercises in this module will come soon and we will send out Doodles to decide the time



Any questions?

- Please let us know if you're wondering about anything about the course!
- We're all in improvisation mode...
- Ask us now or get in touch over email