Thesis proposal:

Neural Networks for Dependency Parsing

Suitable for a Master’s thesis (30 credits)

Background

Dependency parsing is the task of mapping a natural language sentence into a representation of its syntax or semantics in the form of a dependency graph. Most existing dependency parsers rely on machine learning models with millions of hand-crafted features, making developing and maintaining these systems expensive and error-prone. Models based on neural networks promise a solution to this problem, as they are able to learn new features automatically. The scientific purpose of this project is to get a better understanding of the possibilities and limitations of neural networks in the context of an existing system for dependency parsing.

Project description

The Natural Language Processing group has developed a system for syntactic dependency parsing based on a machine learning model called the structured perceptron (github.com/liu-nlp/beta). Your task is to replace this model with a new model based on neural networks. In order to do this you will have to

- get a thorough understanding of the existing dependency parser
- read about current models for parsing based on neural networks
- select one of these models and implement it
- evaluate the resulting system on standard data sets
- summarise and discuss your findings in a final report

Student profile

To succeed with this project you should

- be familiar with basic principles of language technology
- be familiar with data structures and algorithms
- know about architectures and training methods for neural networks
- be able to program in either Java or Python

Contact

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