

Capturing Dependency Syntax with “Deep” Sequential Models

Yoav Goldberg

Bar Ilan University

Department of Computer Science

Ramat-Gan, Israel

yoav.goldberg@gmail.com

Neural network (“deep learning”) models are taking over machine learning approaches for language by storm. In particular, recurrent neural networks (RNNs), which are flexible non-markovian models of sequential data, were shown to be effective for a variety of language processing tasks. Somewhat surprisingly, these seemingly purely sequential models are very capable at modeling syntactic phenomena, and using them result in very strong dependency parsers, for a variety of languages.

In this talk, I will briefly describe recurrent-networks, and present empirical evidence for their capabilities of learning the subject-verb agreement relation in naturally occurring text, from relatively indirect supervision. This part is based on my joint work with Tal Linzen and Emmanuel Dupoux. I will then describe bi-directional recurrent networks - a simple extension of recurrent networks - and show how they can be used as the basis of state-of-the-art dependency parsers. This is based on my work with Eliyahu Kipperwasser, but will also touch on work by other researchers in that space.