**Bernd Bohnet: Linguistic representations in neural network times**

Structured representations have been important for enabling machines to understand human utterances and communicate with humans in a more natural fashion. The past decade has witnessed further dramatic improvements in Natural Language Processing as a result of the paradigm shift to neural networks. However, the role of structured linguistic representations has recently been attenuated by the emergence of neural Language Models (ELMO, Bert, etc.) that provide rich linguistic information represented in the layers of deep neural nets.

In this talk, I will present current state of the art techniques for part-of-speech tagging and dependency parsing. I will discuss techniques in which these explicit structural representations can still be usefully employed and illustrate their integration in downstream applications for instance via tree embeddings and convolutional neural networks.

**Miryam de Lhoneux: Do we need recursive subtree composition in dependency parsing?**

In this talk, I ask the question of whether recursively composing subtree representations is necessary in neural transition-based parsing. In a first study, we evaluate the impact of using a recursive composition function, a tree layer, on top of a highly accurate sequential model for dependency parsing: a BiLSTM-based parser, on a sample of typologically varied languages. We find this tree layer to be superfluous in our architecture and investigate its interaction with other parts of the network. In a second study, we investigate transitivity and agreement information learned by our parser for auxiliary verb constructions (AVCs) and the impact of using a tree layer to model the relation between auxiliaries and main verbs. We find the tree layer to be useful here: it allows the parser to learn a similar amount information about these tasks for AVCs as it does for finite main verbs. We motivate why this is desirable by referring to work from theoretical dependency grammar. Our findings from this study indicate that there may be benefits from using a tree layer which does not reflect in parsing accuracy and that we may not have found the best way to incorporate this layer into our architecture yet.

**Ellie Pavlick: What should constitute natural language ‘understanding‘?**

tba

**Vered Shwartz: Not a piece of cake: on lexical composition and implicit information**

Obtaining phrase representations by composing their constituent word vectors is an alternative to the low-quality distributional representations of infrequent phrases. Have contextualized word representations, like BERT, made lexical composition trivial? This talk will start by evaluating existing word representations for their capacity to address issues related to lexical composition. We found that contextualized word representations excel in detecting that the meaning of the phrase deviates from the meaning of its constituent words, such as for idiomatic noun compounds ("guilt trip") and verb-particle constructions ("carry on"). However, they still struggle with recovering implicit information introduced by the composition ("olive oil" is oil made of olives, while "baby oil" is oil made for babies).

I will then dive into revealing implicit meaning in compositional noun compounds. I will review various composition functions, discuss a method for noun compound relation classification to predefined relationships (e.g. source, purpose), and a model for free-text paraphrasing of noun compounds ("oil made of olives"). The talk will conclude by suggesting future research directions for obtaining meaningful phrase representations, and the many challenges on the way there.