
The Impact of Attention Mechanism, Context and Genre Information when Classifying Semantic Clause Types with Recurrent Neural Networks: A Linguistic Analysis

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Semantic Clause Types (SCT) such as States, Events or Generic Sentences are linguistic characterizations of aspectual properties. They can be distinguished by syntactic-semantic and contextual features and by their function within a text. Recent work on classifying SCT relies on feature-based classifiers (Friedrich et al. 2016). In this work, we frame this task in a recurrent neural network architecture. Those networks are fed with word representations which capture lexical, syntactic and semantic features. Our model is enhanced with attention (Rocktäschel et al. 2016) which allows to focus on specific words and enables linguistic insights. Since it has been shown that n-grams cluster in texts and that SCT and their n-grams differ among genres (cf. Friedrich/Pinkal 2015), we incorporate previous clauses, labels of previous clauses, and information about textual genres. We present experiments for English and German. Compared to the strong baseline provided by Friedrich et al. (2016), we achieve competitive performance and find that attention as well as context and genre information improve our model. The focus of this work is then on the detailed linguistic analysis of the impact of attention mechanism, context information and genre characteristics.

NOTE: some of the material presented in this paper overlaps with Becker et al. 2017.

References: • Becker, M., Staniek, M., Nastase, V., Palmer, A., Frank, A. (2017): Classifying Semantic Clause Types: Modeling Context and Genre Characteristics with RNNs and Attention. *SEM • Friedrich, A., Pinkal, M. (2015): Discourse-sensitive Automatic Identification of Generic Expressions. ACL • Friedrich, A., Palmer, A., Pinkal, M. (2016): Situation entity types: automatic classification of clause-level aspect. ACL • Rocktäschel, T., Grefenstette, E., Hermann, K., Kocisky, T., Blunsom, P. (2016): Reasoning about entailment with neural attention. ICLR.