Tense and Aspect in Multilingual Semantic Construction  
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The semantics associated with verbal morphology – especially tense and aspect categories – are constantly challenging researchers in both the theoretic and applied approaches to syntactic and semantic modeling. However, their treatment in NLP efforts often remains on a fairly basic level that is centralized around English tense and aspect categories. In this talk we present a more fine grained annotation of tense and aspect categories based on (deep) syntactic analysis that allows us to analyze languages in parallel, while still paying attention to the different realizations of tense and aspect features across languages.

The annotation scheme has a modular structure consisting of three distinct elements: Syntactic representation, semantic representation and the syntax/semantics interface. For the first module, the syntax, we employ the constraint-based syntactic formalism Lexical Functional grammar which is specifically suitable thanks to its rich syntactic representations. The semantic representation is a set of features partially based on existing computational and theoretical approaches that are translatable into logical representations. The third element, the syntax-semantics interface, can be understood as a series of inference or construction rules that generate semantic properties from the syntactic input. The main innovation of this approach that it allows for the treatment of primary semantic meaning – i.e. the meaning encoded directly in the syntax – and secondary semantic meaning – alternative or additional meanings of certain morphological markers such as defeasible implications or meaning shifts. Thus, the annotation scheme is particularly well suited to account for the polysemous character of many morphosyntactic expressions that pertain to the linguistic categories of tense and aspect. As a simple example consider the two parallel sentences in (1).

(1) [Q: When you visited Peter yesterday, what did he do after you had dinner?]
   a. Peter skrev et brev
      Peter write.past a letter
   b. Peter hat einen Brief geschrieben
      Peter have INDEF letter write.ppart

The Norwegian sentence in (1a) using a simple past marker and the German sentence in (1b) are parallel in meaning for all intents and purposes, despite the fact that different syntactic realizations are chosen. Thus in the cases above the rules syntactic past → semantic past and perfect → semantic past hold respectively. The importance of this is that the two different realizations of semantic past tense are subject to the same set of semantic construction rules such as for example the Sequence-of-tense rule which shifts the meaning of a semantic tense embedded under a propositional attitude verb such as "say". Its effect is illustrated in (2).

(2) Tom said that Karen was sick.
   a. Tom said: Karen is sick.
   b. Tom said: Karen was sick.

As illustrated in the example above, the event described in the complement, be sick, can be placed in time more freely than expected assuming that semantic tense is interpreted as a temporal precedence operator. In that case only the second reading in (2) would be expected. However, the availability of both of these reading indicates a difference in meaning between tense markers in matrix sentences and tense markers in complement sentences. Crucially, this meaning shift also obtains if we use alternative methods of expressing past tense such as the perfect construction illustrated before. Thus, it is a result of both syntactic and semantic features which together override the expected meaning of the syntactic past tense.

The fine grained annotation that we present here is designed to deal with commonalities and variation across languages and shows, how we can parallelize language analysis without giving up on a linguistically deep analysis of each respective language.