

Incremental Semantic Interpretation of Dialogue Contributions

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Spoken dialogue systems can benefit from incremental processing in at least two ways: First, intermediary processing results can be sent to following modules, so that the system's overall behaviour is more responsive. Second, 'higher-level' modules can give feedback to 'lower-level' ones in order to guide their processing in potentially promising directions. I present an approach to incremental semantic construction, that can be used for both.

I adapt the semantic algebra of RMRS (Copestake, 2007), which enables the monotonous construction of underspecified semantic representations, for left-to-right top-down tree interpretation and combine it with an efficient probabilistic incremental top-down parser (Roark, 2001). As a result, syntactic and semantic representations can be derived fully synchronously, incrementally and continuously: The additional contribution of every new word is integrated in a maximally connected semantic representation, without the need of re-computing already established intermediary results. A reference resolution module can then use these incrementally growing semantic representations to continuously provide feedback to the parser by downrating referentially implausible readings.

The approach has been implemented in the InProTK (Schlangen et al., 2010). I present the results of an experiment, where this form of reference feedback improved the performance of the NLU component.

References:

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