

Reconciling vectors with proofs for natural language processing

Richard Moot (LIRMM & University of Montpellier)

Type-logical grammars are a linguistic formalism which represents words by formulas and which replaces rules of grammar by logical rules. In this logical setup, grammaticality corresponds to provability and parsing corresponds to theorem proving. This provides a natural view of compositionality by means of the Curry-Howard isomorphism between proofs and lambda terms: the syntactic proof tells us directly how to combine the meanings from the lexicon.

Many modern systems use vectors to represent aspects of morphology and word meaning. Vector representations are the de facto standard for many applications in natural language processing, from word sense disambiguation to syntactic parsing and question answering. We will look at ways to reconcile the type-logical and the word vector approaches to natural language. This requires strategies for propagating vector information through type-logical proofs, with implications both for compositionality of vector semantics and for natural language processing using type-logical grammars.