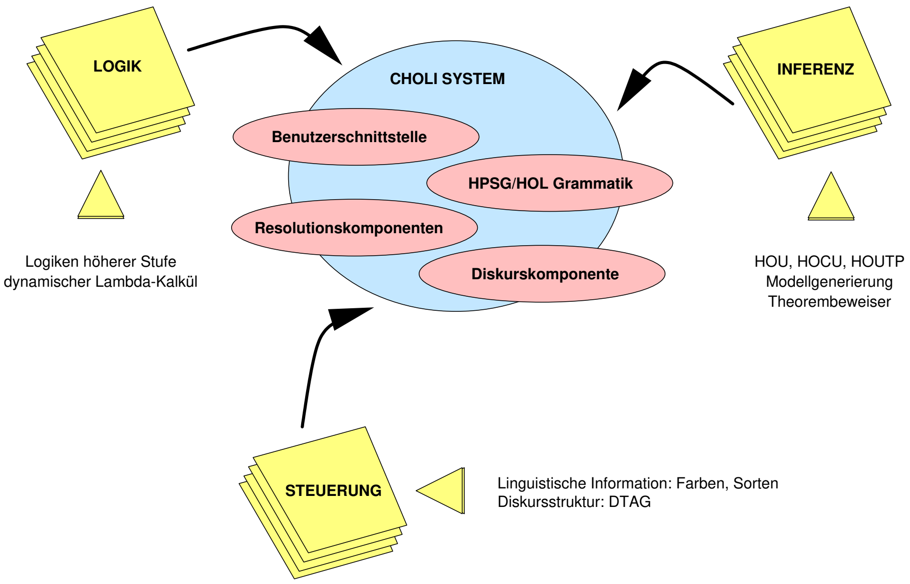
LISA: Natural Language and Inference



Obviously, the meaning of a text is more than just its explicit meaning. On the basis of what we hear, of our general linguistic and non-linguistic knowledge and of the situational context, we draw a number of inferences and thereby reconstruct the (more or less) full meaning of the message intended by our interlocutor. We use inference for instance to: resolve anaphors and ellipses, establish relational links between discourse segments and recover implicit implicatures. Clearly, we draw these inferences very efficiently and the question naturally arises of how to model such efficiency in natural language processing systems.

In the field of theorem proving on the other hand, much progress has been made in the last decades, and theorem provers are now available which perform very efficiently on at least certain classes of mathematical problems.

The goal of the LISA project is to develop representation formalisms and inference techniques that are tailored to the linguistic task of discourse comprehension and generation.

In the first phase, we have concentrated on higher-order representation formalisms and inference procedures to account for the reconstruction of discourse material that is not linguistically realized (verb-phrase ellipses are an example of this) and more generally, of material that is semantically redundant (e.g. deaccenting). We have shown in particular that certain forms of Higher-Order Unification (HOCU, HOUTP) developed in the theorem proving community are more appropriate than others for the natural language understanding task.

In the second phase, we experiment with more general inference procedures and their relevance for natural language processing. In particular, we investigate the usability of general purpose theorem provers for the generation task; we use model generation and abduction to incorporate world knowledge into the semantic analysis process; and we attempt to extend these findings to discourse representation formalisms.

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