Well-founded semantics for description logics

Clemens Kupke

In recent years description logics have increasingly been employed for ontology-based query answering: Instead of querying the available data directly, queries are posed relative to a description logic ontology that encodes domain-specific knowledge. This helps to provide better query answers, in particular, if the given data is incomplete and comes from heterogeneous data sources. From a coalgebraic perspective, ontology-based query answering could be interesting as a field of application for coalgebraic description logics and coalgebraic predicate logic.

In this talk I am going to give a brief introduction to ontology-based data access and I am going to explain why it is desirable to add non-monotonic negation to the ontological layer. Finally I am going to describe two ways of obtaining a semantics for description logics with non-monotonic negation: one using the so-called well-founded semantics and another one using a slight variation that we call “equality-friendly” well-founded semantics. In both cases we obtain decidability and exact complexity bounds for query answering.

This talk is based on joint work with Georg Gottlob, André Hernich and Thomas Lukasiewicz.