

Updating DLs Using the AGM Theory: A Preliminary Study

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1 Introduction and Motivation

The problem of updating DL KBs in the face of new information has received inadequate attention in the relevant literature. We believe that the problem is not significantly different from the general problem of *belief change*, so one possible way of addressing it would be to migrate techniques from the belief change literature to DLs. This way, one could exploit more than 20 years of research regarding the “rationality” of belief change operators, since the concept of rationality is independent of the underlying knowledge representation scheme used.

We follow this path by applying a generalized version of the AGM theory of contraction [1, 2] to DLs; the contribution of our current work is the determination of the applicability of the approach in several DLs. For more details, refer to [3].

2 Results and Lessons Learnt

Our study showed that the generalized AGM theory of contraction can be applied to certain, but not all DLs. In effect, there are certain DLs in which no operator that satisfies the generalized AGM postulates for contraction can be defined and others which admit such operator(s); the latter DLs are called *AGM-compliant*. We showed conditions under which a DL is or is not AGM-compliant and proposed certain heuristics as well as a methodology for determining the AGM-compliance of a DL. In particular, it was shown that role axioms and the existence of role intersection and role complement in the DL at hand play a very important role as far as AGM-compliance is concerned.

References

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