Dynamics of belief: Horn knowledge base and database updates

Delhibabu R.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Springer International Publishing Switzerland 2015. The dynamics of belief and knowledge is one of the major components of any autonomous system that should be able to incorporate new pieces of information. In order to apply the rationality result of belief dynamics theory to various practical problems, it should be generalized in two respects: first it should allow a certain part of belief to be declared as immutable; and second, the belief state need not be deductively closed. Such a generalization of belief dynamics, referred to as base dynamics, is presented in this paper, along with the concept of a generalized revision algorithm for knowledge bases (Horn or Horn logic with stratified negation). We show that knowledge base dynamics has an interesting connection with kernel change via hitting set and abduction. In this paper, we show how techniques from disjunctive logic programming can be used for efficient (deductive) database updates. The key idea is to transform the given database together with the update request into a disjunctive (datalog) logic program and apply disjunctive techniques (such as minimal model reasoning) to solve the original update problem. The approach extends and integrates standard techniques for efficient query answering and integrity checking. The generation of a hit- ting set is carried out through a hyper tableaux calculus and magic set that is focused on the goal of minimality. The present paper provides a comparative study of view update algorithms in rational approach. For, understand the basic concepts with abduction, we provide an abductive framework for knowledge base dynamics. Finally, we demonstrate how belief base dynamics can provide an axiomatic characterization for insertion a view atom to the database. We give a quick overview of the main operators for belief change, in particular, belief updates versus database updates.

Keywords