

Abstract

We live in a world, where common sense is applied almost everywhere. To apply common sense is to understand simple facts about people and everyday life. The study of commonsense knowledge and reasoning is important, whether to help understand how humans think or to make computers reason with common sense. In recent years, there has been a considerable amount of research into logic languages and their use for knowledge representation. One of the attempts is to use them to represent commonsense knowledge and reasoning. As defined by John McCarthy, commonsense knowledge is the knowledge about the world, as opposed to the specialist's knowledge. Logic languages allow the user to represent commonsense knowledge in concise, easy to read statements. Moreover, for computation, these statements can be translated into a logic program.

In this thesis, we first investigate different opinions on what is common sense. We compare the definitions of various researchers and then conclude the most important characteristics of commonsense knowledge and reasoning. For instance, we realize that the commonsense reasoning is non-monotonic. After that we research the different formalisms available for knowledge representation and reasoning. We choose to use Answer Set Programming (ASP), because the language of ASP is suitable for our purpose. The two main reasons are that first, ASP has non-monotonic features, which allow us to represent defaults, inertia rule, incomplete information and causality. Second, ASP has a clear semantics. That is, a precise meaning is associated with every logic program Π ,

so that we know how to answer queries about Π . The intuition of the answer sets is that these are beliefs of an intelligent agent. Moreover, there are fast inference mechanisms available for ASP, such as Smodels and DLV.

We illustrate, using two different domains, that ASP is powerful and usable for commonsense knowledge representation and reasoning. Although we mention the use of ASP in few domains, it is, in fact, effective for a broader range of applications.

In addition, we reference the use of event calculus as another tool for commonsense reasoning. Even though we use the definition of commonsense knowledge from McCarthy, we also review different points of view from psychologists and computer science researchers from diverse areas.