

Default Logic as a Formalism for Understanding Commonsense Reasoning

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Abstract

Commonsense reasoning is the reasoning of agents interacting with the real world. Non monotonic reasoning is a well developed research area gathering the logical formalisms that treat commonsense reasoning. One of the best known of such formalisms is Default logic. In this paper we discuss Default logic at both the proof-theoretic and semantics levels and show that Default logic provides a clear and formal framework to understand the logical nature of commonsense reasoning.

1 Introduction

Commonsense reasoning is the way an agent reasons about the real world: drawing conclusions from an incomplete information on the current state of affairs, taking decisions on the basis of her belief set, planning actions or strategies on the basis of some partial knowledge of the accounted task, etc..

Many formalisms have been devised in the AI community to face commonsense reasoning in the perspective of creating “intelligent” agents. These formalisms allow the knowledge of the world, gained by current inferences, to be changed whenever new information on the state of the world is acquired. Therefore, all these formalisms are *non monotonic*, where the term non monotonic stands for a particular property of logical inference referring to an extension of classical inference. Classical inference is monotonic, that is, any conclusion that can be derived by a set of initial assumptions, can be still derived when adding new information

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