

学术研究

一种规约于可满足性问题 (SAT) 的知识推理算法*

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摘要

传统的知识推理算法主要依赖于通用的定理证明器, 因此会有明显的组合爆炸问题和半自动化问题, 只能处理小规模的问题。在文[1]中, 给出了一个实用而紧致的知识的语义模型——知识结构 (knowledge structure), 并给出相应的利用BDD (Binary Decision Diagram) 的符号化计算方法, 实验表明这种基于BDD的算法比传统方法有很大的优势, 但这种基于BDD 的方法在计算规模大的例子时仍存在明显的组合爆炸。文章在知识结构 (knowledge structure) 的语义基础上, 通过挖掘知识结构语义中各元素的关系, 把知识的计算规约于可满足性问题 (SAT), 因为SAT Solver在符号化计算方面以及在计算规模和效率上都要明显优于BDD。实验结果证实了这种方法的有效性。

关键词

[知识结构](#) [知识推理](#) [可满足性问题 \(SAT\)](#)

分类号

SAT-based algorithm for knowledge reasoning

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Abstract

Traditional knowledge reasonings rely on the general theorem provers and may suffer the state explosion problem and can only deal with toy examples. A more concrete model of knowledge called knowledge structure has been introduced in [1], which presents a BDD-based approach for computing knowledge and shows great improvement. But the BDD-based approach still has a substantial state explosion problem. Based on the knowledge structure, an alternative and effective way by SAT solving for the knowledge reasoning in a group of agents is illustrated, since SAT can be much more powerful in dealing with the state explosion problem than BDDs. Finally the experimental results prove this.

Key words

[knowledge structure](#) [knowledge reasoning](#) [satisfiability \(SAT\)](#)

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