Model-Assisted Approaches for Relational Reinforcement Learning

Tom Croonenborghs, Jan Ramon, Hendrik Blockeel and Maurice Bruynooghe
K.U.Leuven, Dept. of Computer Science, Celestijnenlaan 200A, B-3001 Leuven

Abstract. In recent years, there has been a growing interest in using rich representations such as relational languages for reinforcement learning. However, while expressive languages have many advantages in terms of generalization and reasoning, extending existing approaches to such a relational setting is a non-trivial problem. For a relational reinforcement learning (RRL) agent, learning a model of the world can be very helpful. However, in many situations learning a perfect model is not possible. Therefore, only probabilistic methods capable of taking uncertainty into account can be used to exploit the collected knowledge. We present a first step towards the online learning and exploitation of relational models. We propose a representation for the transition and reward function that can be learned online and present a method that exploits these models by augmenting Relational Reinforcement Learning algorithms with planning techniques.

References


Keywords

RELATIONAL REINFORCEMENT LEARNING, PROBABILISTIC LOGICAL MODELS