Research Review - Historical Developments

In this short review three major planning developments are described including their relevance for the artificial intelligence.

One of the earliest automated planner is STRIPS (Stanford Research Institute Problem Solver) developed by Richard Fikes and Nils Nelsson in 1971 [1]. The STRIPS problem solver attempts to find sequence of operators to transform a given initial state model into a model in which a given formula can be proven to be true. It has been developed as part of the Shakey Robot project [2] at SRI (Stanford Research Institute), but it was more important regarding the representation language it created which is very close to the “classical” planning language [3].

ADL (Action Description Language) is another planning system for robot moves that is considered to be an improvement over STRIPS [3]. It relaxes some constraints imposed by STRIPS to be able to model real world problems in a simpler way [4]. STRIPS for instance does not allow positive and negative literals. However there is a way to compile ADL into STRIPS.

Usually research used linear planning than expects totally ordered action sequences, which however has been discovered to be incomplete. For a planner to be complete it must allow for interleaving of actions from different sub plans within a single sequence. One possible solution to the interleaving problem is goal regression planning which has been used by Warren’s Warplan [5]. The planner is the first being written in logic programming language, Prolog in this case. Warplan is a good showcase for the reduced size and so complexity that can be achieved by using logic programming (e.g. Warplan is just 100 lines of code)

References

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4. Formulating Multi-Agent Dynamic-World Problems in the Classical Planning Framework In Reasoning About Actions and Plans: Proceedings of the 1986 Workshop (1987), pp. 47-82 by Edwin P. D. Pednault edited by Michael P. Georgeff, Amy L. Lansky
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