Planning Historical Developments Research Review

This review is to explore important historical developments in the field of AI planning and search, as well as the relationships between these developments and their impact on the field of AI as a whole.

Stanford Research Institute Problem Solver (STRIPS)

STRIPS is an automated planner designed by Richard Fikes and Nils Nilsson. The automated planner goal was to find a series of operators in a space of world models to transform a given initial world model into a model in which a given goal formula can be proven to be true [1]. STRIPS is the first major planning system, which built a solid foundation for formal language for automated planning systems. To define what initial state, actions and goal are, STRIPS made the progress on creating a structural language to solve real-world problems.

Planning Domain Definition Language (PDDL)

The PDDL aims at standardizing planning language and syntax from STRIPS, ADL, and other languages. PDDL has been used as the standard language for the planning competitions at the AIPS conference, beginning in 1998[2]. The PDDL further introduces domain description and the related problem description into the model [4]. The usage of a common language encourages greater reuse of research, allows more direct comparing of systems and approaches in an easier way and thus support faster progress in the artificial intelligence field [4].

WARPLAN

WARPLAN was the first planner to be written in a logic programming language (Prolog) [2]. The implementation of a planner using such language was able to showcase the great benefits in terms of reduced complexity that can be achieved by using logic programming languages, and WARPLAN is only 100 lines of code [2]. In addition, WARPLAN provided a solution to duel with interleaving of actions and conflict between subgoals. This was achieved by total-order planning, which is a plan consists of an ordered set of actions.

References

1. Richard E. Fikes, Nils J. Nilsson (Winter 1971). "STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving".

2. Stuart J. Russell, Peter Norvig (2010), Artificial Intelligence: A Modern Approach (3rd Edition).

3. Nilsson, N. J. Problem-Solving Methods in Artificial Intelligence. McGraw-Hill Book Company, New York, New York, 1971.

4. M.; Long, D. (2002). "PDDL+: Modeling continuous time dependent effects". Proceedings of the 3rd International NASA Workshop on Planning and Scheduling for Space.