

Research Review

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State-space search, theorem proving, and control theory as well as practical requirements for robotics, scheduling and other domains cultivate the AI planning. The first major advancement in AI planning was STRIPS (Fikes and Nilsson, 1971), the first major planning system that implements the interaction of these influences. The biggest influence on STRIPS was its action representation. Almost all the planning systems after STRIPS have used similar STRIPS structure. For example, the Action Description Language or ADL, (Pednault, 1986) adapt the restrictions in the STRIPS language and extent it to represent more realistic problems. Few years later, the Problem Domain Description Language or PDDL (Ghallab et al., 1998) was used for computer-parsable, standardized syntax for representing STRIPS, ADL, and other languages. Since then, PDDL has become the AIPS conference standard planning language.

In the early 1970s, researchers focused on totally ordered action sequences, or linear planning. But soon linear planning was proved to be incomplete and cannot even solve some very simple problems. A complete planning agent must allow for interleaving of actions from different subplans within a single sequence.

Regression planning was one solution to the interleaving problem. Regression planning is a technique in which steps in a totally ordered plan are reordered so as to avoid conflict between subgoals.

Partial-order planning was the major focus on AI planning research for more than two decades. The detection of conflicts (Tate, 1975a) and the protection of achieved conditions from interference (Sussman, 1975) are the ideas for partial-order planning.

Up until recently, binary decision diagrams, a compact description of finite state automata widely used in the hardware verification community (Clarke and Grumberg, 1987; McMillan, 1993), has been interest in the representation of plans.