

STRIPS (Fikes and Nilsson, 1971):

STRIPS is a problem-solving program that search “world models” to find one in which a given goal is achieved, the problem space is defined by initial model, set of available operators, their effects, and a goal statement, each operator has conditions to be applicable, and effect which need to be added to the model or removed if no longer true.

STRIPS adopted the GPS[General Problem Solver (Newell and Simon, 1961)] strategy in which it attempt to reduce the difference between the model and the goal by applying the most relevant operators, and solving pre-conditions of relevant operators as sub-goals[1].

HACKER (Sussman, 1973):

HACKER is a computer problem solving system whose performance improves with practice, HACKER has “Answer Library” in which it uses it to solve a given problem from the list of procedures, if no procedure is found, the system try to develop a new procedure from a general knowledge of the problem domain then adds it to the library, when the solution goes wrong, HACKER has a general debugging knowledge, it uses it to analysis unanticipated interactions, and fix the bug, improving it’s performance knowledge. [2]

TWEAK(David, 1987) :

TWEAK is a nonlinear domain-independent planner program, that David proved its completeness and correctness, it consist of 3 layers

- Plan representation: a plan is an object that must fit set of constraints, those constraints can also be looked as a search strategy that rule out chunks of the search space.
- Making a plan achieve a goal: TWEAK has all the time an incomplete plan which is an approximation of the final plan, the goal-achievement procedure is derived by interpreting the necessary truth criterion as a nondeterministic procedure. The criterion tells us all the ways a proposition could be necessarily true; it chooses one of them and modifies the plan accordingly. It adds constraints to make a situation be before another or to make two propositions co-designate or not co-designate, if the constraints are not compatible with existing ones, a failure will be signaled and the top-level control will backtracks.
- Top-level control structure: consist of a loop in which a goal is chosen, try to achieve the goal by applying the above procedure, a new plan is developed, once all goals are solved, the plan is found, choosing which goal was not trivial, it’s using dependency-directed breadth first-search[3]

References

1. Richard E. Fikes, Nils J. Nilsson (Winter 1971). "STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving"
2. Sussman, Gerald J, HACKER(1973). "A Computational Model of Skill Acquisition"
3. David Chapman - 1987 "Planning for Conjunctive Goals".