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June 26, 2017

RESEARCH REVIEW OF AI PLANNING AND SEARCH

AI planning arose from investigations into state-space search, theorem proving, and control theory and from the practical needs of robotics, scheduling, and other domains. One of major developments in AI planning would be classical language (or the representation language) to encode the problem. Classical languages like ADL/PDDL made it possible to encode the more realistic problems.

PDDL is intended to express the physics of a domain, that is, what predicates there are, what actions are possible, what the structure of compound actions is, and what the effects of actions are. (PDDL version 1.2, Ghallab et al, 1998) Most planners require in addition some kind of "advice", that is, annotations about which actions to use in attaining, which goals, or in carrying out which compound actions, under which circumstances. But there is no advice at all as part of PDDL notation. As a result of this neutrality, almost all planners require extending the notation, but every planner can extend it in different ways. PDDL has been used as the standard language for the International Planning Competition since 1998.

Another major developments in AL planning is partial-order planning. Planners in the early 1970s generally considered totally ordered action sequences. Problem decomposition was achieved by linear planning. Linear planning cannot solve inter-leaving of actions from different subplots within a single sequence. Partial-order planning is introduced to address this issue.

TWEAK (Planning for Conjunctive Goals, Chapman, 1987) was the first clear formal exposition of partial-order planning. TWEAK is an implemented, running program and comes in three layers: a plan representation, a way to make a plan achieve a goal, and a top-level control structure. TWEAK is constraint-posting planner. Constraint posting is the process of defining an object, a play in this case, by incrementally specifying partial descriptions (constraints) it must fit. Alternatively, constraint posting can be viewed as a search strategy in which, rather than generating and testing specific alternatives, chunks of the search space are progressively removed from consideration by constraints that rule them out, until finally every remaining alternative is satisfactory. The advantage of the constraint-planning approach is that properties of the object being searched for don not have to be chosen until a reasoned decision can be made. This reduction of arbitrary choice often reduces backtracking.

The resurgence of interest in state-space planning was pioneered by Drew McDermott's UnPOP. Heuristic Search Planner (HSP) made the state-space search practical for large planning problems. The formulation of classical planning as heuristic search has turned out to be a fruitful approach leading to powerful planners and a perspective on planning where the extraction of good heuristics is a key issue. This idea is taken into the domain of planning with incomplete information. Planning with incomplete information is distinguished from classical planning in the type and amount of information available at planning and execution time. (Planning with Incomplete Information as Heuristic Search in Belief Space, Bonet and Geffner, 1999)