IMPORTANT HISTORICAL DEVELOPMENTS IN THE FIELD OF AI PLANNING AND SEARCH

GENERAL SUMMARY

Early planners resorted to a coercive style in response to environmental uncertainity. WARPLAN-C by Warren in 1976 was one of the earliest planners to use conditional actions. Olawski and Gini laid out the major issues involved in conditional planning. To resolve these issues, partial-order conditional planning systems such as UWL and CNLP were developed. Finally, planners such as C-BURIDAN adopted to handle conditional planning for actions with probabilistic outcomes.

The earliest major treatment of execution monitoring was PLANEX, which worked with the STRIPS planner to control the robot Shakey. PLANEX used triangle tables to allow recovery from partial execution failure without complete replanning. The action representation used by STRIPS has been very influential than its algorithmic approach. Unfortunately, the proliferation of variants made comparisons needlessly difficult. The ADL (Action Description Language) relaxed some of the restrictions in the STRIPS language and made it possible to encode more realistic problems.[1]

THREE KEY DEVELOPMENTS

WARPLAN:

WARPLAN developed in 1974 uses goal regression planning, a technique in which steps in a totally ordered plan are reordered to avoid conflict between subgoals. This solved the problem of interleaving of actions from different subplans within a single sequence. WARPLAN is also notable in that it was the first planner to be written in a logic programming language (Prolog)[2] and is one of the best examples of the remarkable economy that can sometimes be gained by using logic programming: WARPLAN is only 100 lines of code [3], a small fraction of the size of comparable planners of the time. The WARPLAN was then turned into WARPLAN-C[4]

SATPLAN

In 1992, planning as satisfiability (SATPLAN) algorithm was proposed by Kautz and Selman [5] SATPLAN is a formal model of planning based on satisfiability rather than deduction. The creators of SATPLAN claim that satisfiability approach not only provides a more flexible framework for starting different kinds of constraints on plans, but also more accurately reflects the theory behind modern constraint based planning systems.

UNPOP

UNPOP was the result of the result of the resurgence of interest in state-space planning. It was developed in 1996 by Drew Mcdermott. Drew suggested a distance heuristic based on a relaxed problem with delete lists ignored. UNPOP is a planner that uses regression-match graphs to control search[6]

1. http://aima.cs.berkeley.edu/2nd-ed/newchap11.pdf

2. https://web.stanford.edu/class/linguist289/p37-colmerauer.pdf

3. http://www.j-paine.org/prolog/eden/plog/bugs/warplan.pl

4. http://homes.cs.washington.edu/~weld/papers/kr92.pdf

5. http://www.cs.rochester.edu/users/faculty/kautz/satplan/index.htm

6. http://www.cs.yale.edu/homes/dvm/