

Research Review

STRIPS arose out of a need for robotic agents to be able to take actions in “more complex and general world models” (Fikes and Nilsson, 1971) than what A.I. had achieved thus far in gaming agents.

Until then, the model world of used to find solutions in simple puzzles and games, could be modelled using matrices/lists. However, this was not enough for modelling more complex worlds. STRIPS achieved exactly this using first-order-predicate logic formulas. Furthermore, by treating theorem proving and searching through a state space as two distinct processes, it managed to surpass previous difficulties that limited problem-solvers’ successfulness to trivial problems.

However, STRIPS still had severe limitations arising from its assumptions; namely that only one action could be taken at any one time and that everything that changed was a result of a planned action (Fikes and Nilsson, 1993). Additionally, the STRIPS solution was not only vague, but also flawed - words coming from its own creators. These problems were not resolved until 1986 by Lifschitz who developed more precise definitions.

Nonetheless, even with all these limitations, STRIPS was the main tool used in automatic planning research for many years because researchers were able to model more complex worlds by extending STRIPS and making it able to model more abstract and even dynamic worlds (Fikes and Nilsson, 1993).

However, all these variants had the effect of making comparisons of the limitations and benefits of each variant difficult. With time, ADL (Action Description Language) was developed which relaxed some of the restrictions of STRIP, thus making the modelling of more realistic problems feasible.

ADL relaxed the assumption that “one would be dealing exclusively with actions that produce the same effects in every situation” (Pednault, 1988). The extension introduced the so-called secondary preconditions which are in essence action subgoals on top of the basic preconditions that STRIPS used.

ADL, STRIPS and UMCP was used as the basis of PDDL - The Planning Domain Definition Language. According to its authors, (Ghallab et al, 1998) The main difference between PDDL and other planners was that its authors refrained from providing ‘advice’ - “annotations about which actions to use in attaining which goals” (Ghallab et al, 1998) and thus required the extension of the language by each specific planner. PDDL became the standard language in planning competitions in 1998.