

The first major planning system was called STRIPS, which stands for **S**tanford **R**esearch **I**nstitute **P**roblem **S**olver. Looking at the representation of problems used with the solver, there are starting states, goal states, and actions with preconditions and postconditions. All of these elements are present in planning systems going forward, which is a huge influence. Subsequent developments in planning systems are building new search techniques on this framework set by STRIPS. (Fikes)

In 1992, H.A. Kautz and B. Selman introduced a technique to convert planning problems into boolean satisfiability problems called SATPLAN. This allowed planning problems to benefit from all the advancements in boolean satisfiability problems, which had been proven to be NP-Complete. (Cook) Now planning problems could be solved by the likes of the Davis–Putnam–Logemann–Loveland (DPLL) algorithm and WalkSAT. Variants of these techniques have proved to be some of the best methods of searching through planning problems. (Kautz and Selman)

Another huge development in the planning space was the introduction of GRAPHPLAN. This algorithm removed the search limitation where actions being considered at the same time needed to not have effects that interfere with one another. This issue was worked around through the introduction of mutexes. Working around this limitation had the result of increasing the speed at which optimal solutions could be found to problems by orders of magnitude. The graphplan method of looking at planning problems also set up a framework in which many new heuristics could be derived. (Blum)

Bibliography

Blum, A. L. and Furst, M. (1995). "Fast planning through planning graph analysis."

Cook, Stephen (1971). "The complexity of theorem proving procedures"

Fikes, R. E. and Nilsson, N.J. (1971). "STRIPS: A new approach to the application of theorem proving to problem solving."

H. A. Kautz and B. Selman (1992). "Planning as satisfiability." In *Proceedings of the Tenth European Conference on Artificial Intelligence (ECAI'92)*, pages 359-363.