

Research Review

STRIPS

The Stanford Research Institute Problem Solver (STRIPS) was developed using LISP programming in 1970 by Nilsson and Fikes. It was the first of its kind to use First-Order Logic (FOL) to represent and solve problems. It introduces the concept of establishing a problem using three major components: name of an operator and its parameter, preconditions, and effects of the actions [1]. This established the basis for other developments in planning AI such as propositional logic that we have used in this class.

The nonlinear nature of plans

This paper introduced a new concept in the planning space through the development of NOAH, a partial-order planner built on procedural nets [2]. This changed search problems as now, instead of just representing the search space as a set of linear world states, there exists a space of partial plans. One of the key discoveries is the least commitment plan which allowed a set of plans to be represented as a single state of the search. The partial-order planner helped to solve simple problems in which linear planners were unable to.

Planning as a heuristic search

This paper introduces planners as a form of heuristic search [3]. The authors then go on to showcase a family of planners that can compete with the state-of-the-art at that point in time. Heuristic planners present the idea of solving the planning problem through the extraction of heuristics using a general mechanism, making it different from specific planners that solve problems in a narrow domain. The authors also explore the idea of reversing the search direction to evaluate nodes and current states. These ideas are now in famous planners such as GRAPHPLAN which utilize a form of heuristic search planners.

References

- [1] N. J. Nilsson and E. R. Fikes, "STRIPS: A new approach to the application of theorem to problem solving," *Stanford Research Institute*, pp. 189-208, October 1970.
- [2] D. E. Sacerdoti, "The Nonlinear Nature of Plans," Stanford Research Institute, Menlo Park, 1975.
- [3] B. Bonet and H. Geffner, "Planning as a heuristic search," in *Artificial Intelligence*, Caracas, 2000.