

Research review

Important historical developments in the field of AI planning and search

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1. STRIPS (Stanford Research Institute Problem Solver)

STRIPS is the first major planning system that attempts to find a sequence of operators in a space of world models to transform a given initial world model into a model in which a given goal formula can be proven to be true. [1]

STRIPS represents a world model as an arbitrary collection of first-order predicate calculus formulas and is designed to work with models consisting of large numbers of formulas. It employs a resolution theorem prover to answer questions of models and uses means-ends analysis to guide it to the desired goal-satisfying model. [2]

The representation language used by STRIPS has been far more influential than its algorithmic approach; what we call the "classical" language is close to what STRIPS used. [1]

2. PDDL (Planning Domain Definition Language)

PDDL was introduced as a computer-parsable, standardized syntax for representing planning problems and has been used as the **standard language** for the International Planning Competition since 1998. [1]

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. [3]

3. SATPLAN (Planning as Satisfiability)

SATPLAN represents a similar range of mutex relations, but does so by using the general CNF form rather than a specific data structure. [1]

It uses a formal model of planning **based on satisfiability** rather than deduction. The satisfiability approach not only provides a more flexible framework for stating different kinds of constraints on plans, but also accurately reflects the theory behind modern constraint-based planning systems. [4]

References

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4. 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.