

## Research Review

### Stanford Research Institute Problem Solver (STRIPS) and Language

STRIPS is an automated planner developed by Richard Fikes and Nils Nilsson in 1971 at SRI International (Fikes and Nilsson 1971). The language used to provide inputs to the planner was given the same name. The initial version of the STRIPS program was implemented in LISP programming language. For searching through the space of world models, STRIPS utilizes a GPS-like means-end analysis strategy (Ernst and Newell 1969).

STRIPS became the basis for most of the AI planning languages for expressing automated planning problems, i.e. action languages, such as PDDL and ADL.

### Planning Domain Definition Language (PDDL)

PDDL was a result of an attempt by Drew McDermott to standardize AI planning languages. It supports basic STRIPS-style actions, conditional effects, object creation and destruction, domain axioms over stratified theories, specification of safety constraints, specification of hierarchical actions composed of subactions and subgoals, management of multiple domains using differing subsets of language features (McDermott, Ghallab et al. 1998).

The PDDL was derived from several other languages such as the Action Description Language (ADL) and the original STRIPS (Russell and Norvig 2009). One goal of the PDDL development was to provide a notation for problems to be used in the AIPS-98 planning contest.

### Graphplan

Graphplan is an algorithm developed by Avrim Blum and Merrick Furst in 1995 for automated planning (Blum and Furst 1997). The algorithm takes a planning problem expressed in STRIPS as an input and is guaranteed to return a shortest possible partial-order plan, if there exists one.

Unlike the standard planning methods, the Graphplan algorithm does not immediately begin searching, instead it explicitly constructs and analyses a compact, directed, and leveled structure called a *planning graph* to guide its search.

One of the key limitations of the Graphplan algorithm is that it is only applicable to STRIPS-like domains, e.g. actions cannot create new objects, the effects can only be determined statically.

## REFERENCES

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