

Research Review on important historical developments in the field of AI planning and search

STRIPS (Stanford Research Institute Problem Solver)

The Stanford Research Institute Problem Solver (STRIPS) is an automated planning technique that works by executing a domain and problem to find a goal developed by Richard Fikes and Nils Nilsson in 1971 at SRI international. With STRIPS, you first describe the world. You do this by providing objects, actions, preconditions, and effects. Once the world is described, you then provide a problem set. A problem consists of an initial state and a goal condition. STRIPS can then search all possible states, starting from the initial one, executing various actions, until it reaches the goal.

PDDL (Planning Domain Definition Language)

A common language for writing STRIPS domain and problem sets is the Planning Domain Definition Language (PDDL). PDDL lets you write most of the code with English words, so that it can be clearly read and (hopefully) well understood. It's a relatively easy approach to writing simple AI planning problems and is an attempt to standardize Artificial Intelligence planning languages. It was first developed by Drew McDermott and his colleagues in 1998 for the adoption of a common formalism for describing planning domains which fosters far greater reuse of research and allows more direct comparison of systems and approaches, and therefore supports faster progress in the field.

GRAPHPLAN

Graphplan is a general-purpose planner for STRIPS-style domains (Stanford Research Institute Problem Solver), based on ideas used in graph algorithms. Given a problem statement, Graphplan explicitly constructs and annotates a compact structure called a Planning Graph, in which a plan is a kind of "flow" of truth-values through the graph. This

graph has the property that useful information for constraining search can quickly be propagated through the graph as it is being built. Graphplan then exploits this information in the search for a plan. It was first developed by Avrim Blum and Merric Furst in 1995 with subsequent extensions and improvements made by many researchers at many different institutions around the world. The name graphplan is due to the use of a novel planning graph, to reduce the amount of search needed to find the solution from straightforward exploration of the state space graph.

References:

Artificial Intelligence a Modern Approach by Stuart Russel and Peter Norvig

<http://www.cs.cmu.edu/~avrim/graphplan.html>

<https://en.wikipedia.org/wiki/Graphplan>

<https://en.wikipedia.org/wiki/STRIPS>

https://en.wikipedia.org/wiki/Planning_Domain_Definition_Language

<http://www.primaryobjects.com/2015/11/06/artificial-intelligence-planning-with-strips-a-gentle-introduction/>