Research review of AI Planning and Search

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Planning Domain Definition Language

The Planning Domain Definition Language (PDDL) is an attempt to standardize Artificial Intelligence (AI) planning languages. At its core is a simple standardisation of the syntax for expressing this familiar semantics of actions, using pre- and post-conditions to describe the applicability and effects of actions. At its core is a simple standardisation of the syntax for expressing this familiar semantics of actions, using pre- and post-conditions to describe the applicability and effects of actions. The latest version of the language is PDDL3.1.

Graphplan

Graphplan is a general-purpose planner for STRIPS-style domains, based on ideas used in graph algorithms. Graphplan was created by Avrim Blum and Merrick Furst, with subsequent extensions and improvements made by many researchers at many different institutions around the world. 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.

Satplan

Planning as satisfiability (better known as Planning as Satisfiability) is a powerful approach to domain-independent planning (in artificial intelligence) first proposed by Henry Kautz and Bart Selman in their SATPLAN system in the 1990s. It converts the planning problem instance into an instance of the Boolean satisfiability problem. Given a problem instance in planning, with a given initial state, a given set of actions, a goal, and a horizon length, a formula is generated so that the formula is satisfiable if and only if there is a plan with the given horizon length. Practically all work on planning with SAT has used general-purpose SAT solvers.

References

http://users.cecs.anu.edu.au/~patrik/pddlman/writing.html
http://www.cs.cmu.edu/~avrim/graphplan.html
https://users.aalto.fi/~rintanj1/satplan.html