Historical Developments in AI Search and Planning

Search and Planning are the most crucial and developing areas in Artificial intelligence as much advancement in these areas changed the way we see and solve problems these days. In this article, we would like to discuss about a few most recent improvements in search and planning over past years.

STRIPS:

STRIPS which stands for "STanford Research Institute Problem Solver" was a AI planner agent and developed in Stanford Research Institute for controlling the Robot Shake which was one of the first robots built using AI technology. Using STRIPS, we define the problem world - objects, actions, preconditions and effects and then the problem set with initial state and goal condition is defined. So STRIPS can then search all possible states in between, starting from the initial one, executing various actions, until it gets the goal. We use PDDL (Planning Domain Definition Language) to define STRIPS problem world and problem set. STRIPS language has played very important role in AI planning and the base for most of the languages for expressing automated planning problem instances in use today.

ADL:

Action Description Language (ADL) is one of the extensions of STRIPS which seems to relax some of the restrictions in STRIPS in terms of allowing the operator to be conditional and making it possible to encounter more realistic problems. IBM research staff member, Pednault, proposed this language and the core-differentiating factor is that ADL doesn't consider unmentioned literals to be false (STRIPS treats this as false), but rather unknown, it also supports negative literals as well as disjunction in goals.

Graph Plan:

Graph plan is an AI algorithm for automated planning developed by Avrim Blum and Merrick Furst in 1995. Graph plan takes as input a planning problem expressed in STRIPS and generates a sequence of operations for reaching the goal state. The name graph plan is due to the use of a novel planning graph to reduce the amount of search needed to find the solution from open exploration of the state space graph.

References:

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