Project 3: Planning and Search Developments

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Planning and Search Developments

The following advances in AI planning and search that will be briefly summarized are STRIPS, PDDL, and HSP.

STRIPS

STRIPS (Stanford Institute Problem Solver), developed by Richard Fikes and Nils Nilsson in 1971, is a planning technique in which a world is described in order to find a goal to a domain specific problem [1]. It was one of the first major planning systems developed at the time and it was mainly used to rearrange objects and navigate. STRIP works by searching through various world models following a set of given rules and conditions. The problem is then solved once STRIPS produces the best possible plan model that satisfies the given goal.

PDDL

PDDL (Planning Domain Definition Language), developed by Drew McDermott in 1998, it also a planning technique inspired by STRIPS and others. It was created in order to standardize AI planning languages [2]. it uses pre and post-conditions to describe the applicability and effects of actions with the syntax modeled after Lisp. One of the ways PDDL was improved over other planning languages was by its extended expressive power that allows type structures for objects in a domain, actions, constraints, and actions with negative preconditions and conditional effects. All of this allowed for overall better domain specific problem descriptions and results.

HSP

HSP (Heuristic Search Planner), developed by Blai Bonnet and Hector Geffner in 1998, is based on the idea of heuristic search. It starts searching from the initial state and then making it to the goal state using a heuristic search function like A* in order to provide an estimate distance to the given goal [3]. Overall, this search planning algorithm provides an automated approach for determining heuristics to general planning problems.

References:

1. STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving
2. PDDL - The Planning Domain Definition Language
3. HSP: Heuristic Search Planner