Research Review

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Planning and Search have been a core component to AI research and development since the techniques were originally developed. As they have advanced in complexity and proficiency, looser criteria has been required to successfully find a goal solution, and more efficient means of finding the solution have been developed. Some major milestones in the evolution of Planning and Search are described below:

The first major system to be designed was the Stanford Research Institute Problem Solver (STRIPS). This would eventually lay the framework for most modern approaches to the planning problem. STRIPS described the objects, actions, preconditions, and effects within a domain. [1] As long as a problem could be finitely described within these requirements and a static domain, STRIPS would be able to come up with a planning solution. This assumed a single agent acted on the domain to transform it to a new state.
The complexity and number of dynamic agents that could be accounted for were very limited, but the STRIPS framework was historically significant for it's approach in defining a domain. [2]

Another major milestone in the development of planning and search was the ability to construct a plan using only a partial-order of the subgoals. This was pioneered by the Nets of Action Hierarchies (NOAH) planning system. NOAH allowed for the detection of conflicts, using a set of procedures called critics, between subgoals and was capable of resolving these into a sequence of actions. [3] The allowance for interaction between subgoals laid the groundwork for distributed planning systems.

Finally, a major step forward in efficiency for planning and search systems was the ability of the GRAPHPLAN system to increase the efficiency of solution finding by orders of magnitude over previous partial-order approaches like NOAH. Using STRIPS as a base language to describe the domain, GRAPHPLAN then generates a flow of truth states, greatly reducing the space to search. Once the search space has been limited, traditional planning systems can be used much more efficiently. This particular algorithm helped to propel the planning and search systems in the field of AI since they had been struggling with ways of increasing speed and efficiency. [4]

REFERENCES

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