Research Review

Artificial intelligence (AI) has been one of the most controversial domains of inquiry in computer science since it was first proposed in the 1950s. Defined as the part of computer science concerned with designing systems that exhibit the characteristics associated with human intelligence—understanding language, learning, reasoning, solving problems, and so on (Barr and Feigenbaum, 1981)—the field has gained a lot of momentum from researchers and the computer science community for a number of reasons among the were the ambitious goals and enormous underlying intellectual challenges.

The field has been controversial because of its social, ethical, and philosophical implications. Such controversy has affected the funding environment for AI and the objectives of many research programs. This paper will be discussing STRIPS, one of the earliest successful forms of Planning in AI.

STRIPS (Fikes and Nilsson 1971) is the first major automated planning system. It stands for Stanford Research Institute Problem Solver and it was developed by Richard Fikes and Nils Nilsson in 1971 at SRI International. STRIPS is the controlling component of the robot famously known as Shaky, it was capable of doing a number of things among those are:

- traveling to another location
- turning light switches on and off
- opening and closing doors
- climbing up and down from rigid objects
- moving objects

The project didn't include true neutral networks — in the 1960s, the technology just wasn't up to the sort of visual analysis, planning, and navigation Rosen and team wanted to explore — but the automaton did indeed happen. And it could see and move and respond to its environment in at least some basic ways – The team behind STRIPS introduced a formal planning language that was used as input for the planner. One STRIPS instance consists of the following:

- An initial state;
- The specification of the goal states – situations which the planner is trying to reach;
- A set of actions. For each action, the following are included:
    - preconditions (what must be established before the action is performed);
    - post conditions (what is established after the action is performed).

The complexity of deciding whether any plan exists for a propositional STRIPS instance has been shown to be PSPACE-complete (Bylander 1994). Further restrictions can be enforced to make it an NP-complete problem.

The approach used by STRIPS and similar systems (called linear programming) was found to be very inefficient and results weren't very reliable most of the time and it couldn't solve some very simple problems (Sussman 1975). A complete planner must allow for interleaving of actions from different sub-plans within a single sequence.

One solution to this problem was proposed by (Waldinger 1981). Goal regression constructs totally ordered plan and then constructively modifies Plan is to satisfy all sub-goals. This approach was implemented in the planning system WARPLAN. This planner was the first who was written in a logic programing language (Prolog).

References

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