Planning Research Review

By Martin Lopez

STRIPS (STanford Research Institute Problem Solver) by Richard E. Fikes and Nils J. NHsson

A New Approach to the Application of Theorem Proving to Problem Solving

STRIPS is an automated planner designed by Richard Fikes and Nils Nilsson at the Stanford Research Institute while working with robotics. "STRIPS attempts to find a sequence of operators in a space of world models to transform a given initial world model into a model in which a given goal formula can be proven to be true. It employs a resolution theorem prover to answer questions of particular models and uses means-ends analysis to guide it to the desired goal-satisfying model." This lead to a great impact in the field of Artificial Intelligence because of the representation language it created being similar to the "classical" planning language. This language let to finding a set of applicable operators that could be applied on a given state to transform it to the goal state or closer to the goal state. Although STRIPS is usually used in robotics research at the Stanford Research Institute it defined framework to solve many complex planning problems in AI and is central to research in the field.[1]

Artificial Intelligence: A Modern Approach (3rd Edition)

Action Description Language(ADL) Problem Domain Description Language(PDDL)

ADL removes some of STRIPS restrictions and made it possible to apply STRIPS framework to more realistic problems. PDDL actually standardized syntax for representing planning problems on computers and has been the standard language for the International Planning Competition since 1998. This simplification/standardization of representing planning problems made it easier to analyze planning problems, aiding research in the field of planning.[2]

Fast Planning Through Planning Graph Analysis

Graphplan

Graphplan works on STRIPS-like domains and is based on constructing and analyzing a compact structure the paper calls the Planning Graph. Graphplan always returns the shortest possible partial-order plan faster than any total-order planner, Prodigy, and the partial-order planner, UCPOP, on a variety of intriguing planning problems. Graphplan was a step in the right

direction toward having computers plan for us in a large search space in a reasonable amount of time.[3]

References

1. Richard E. Fikes, Nils J. Nilsson (1971). "STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving".

 2. Stuart J. Russell, Peter Norvig (2010), "Artificial Intelligence: A Modern Approach (3rd Edition)".

3. Avrim L. Blum, Merrick L. Furst (1997), "Fast Planning Through Planning Graph Analysis∗".