STRIPS

STRIPS which is stands for “Stanford Research Institute Problem Solver” is an automated planner developed by Richard Fikes and Nils Nilsson in 1971 at SRI International.[1] It was used in Shakey, the first mobile robot with the ability to perceive and reason about its surroundings, for problem-solving.[2]

The problem domain is modelled as object, action, precondition and effect. While comparing with the traditional searching method, STRIPS is easier to define real-world planning problem.

PDDL

The Planning Domain Definition Language (PDDL) was inspired by STRIPS and ADL, a relaxed form of STRIPS which allow negation, and was first developed by Drew McDermott with the hope to encourage empirical evaluation of planner performance, and development of standard sets of problems all in comparable notation.[3] This language allows researchers to exchange benchmark problems and compare results

GraphPlan

Although there is the standard way to define the planning problem, if we find the solution using the traditional state-space graph, the performance would be very low as the graph could be easily go huge.

Avrim Blum, Merrick Furst, John Langford introduce a data structure called Planning Graph. A Planning Graph encodes the planning problem in such a way that many useful constraints inherent in the problem become explicitly available to reduce the amount the search needed.[4] Planning Graph is a polynomial size and can be built in polynomial time.

Conclusion

STRIPS, ADL, and GraphPlan built the foundation of AI planning research and make some complex real-world planning problems being able to solve in polynomial time. We should admire their contribution and keep on working on the field.

Reference

[1] Richard E. Fikes, Nils J. Nilsson (Winter 1971). "STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving"
[2]https://www.sri.com/work/timeline-innovation/timeline.php?timeline=computing-digital#!&innovation=shakey-the-robot
[3] McDermott, Drew; Ghallab, Malik; Howe, Adele; Knoblock, Craig; Ram, Ashwin; Veloso, Manuela; Weld, Daniel; Wilkins, David (1998). "PDDL---The Planning Domain Definition Language"
[4] A. Blum and M. Furst, (1997) "Fast Planning Through Planning Graph Analysis"