Important historical developments in the field of AI planning and search

Introduction

This review focuses on three historical developments, highlighting the relationship between developments and their impact on AI planning research

STRIPS (1971)

Richard Fikes and Nils Nilsson of the Stanford Research Institute have developed this algorithm.
The model attempts to find a sequence of operators in a model space to transform the initial model into a model in which the goal state exists. It attempts to model the world as a set of first-order predicate formulas and is designed to work with models composed of a large number of formulas.

This algorithm introduces a set of operators into the representation of language and in this it positively impacts the field of artificial intelligence.

Planning Graph (1997)

Avrium Blum and Merrick Furst developed a new approach to planning in STRIPS. It was about building and analyzing a brand new object called a planning table.
They developed an algorithm called GraphPlan that gets the solution to the planning problem using a Planning Graph build.

The planning diagram is useful because it encodes explicitly useful constraints, reducing the cost of future searches.

The state space search is exponential and requires a lot more work to build.
Being able to code explicitly useful constraints is a remarkable property.

Heuristic Search Planner (1998)

This is based on a heuristic search. A common way to derive a heuristic function is to solve a relaxed version of the problem. The main problem is that often the heuristic calculation of the relaxed problem is NP-hard.
The HSP algorithm estimates the optimal value of the relaxed problem instead. The algorithm turns the problem into a heuristic search by automatically extracting the heuristics from the STRIPS encodings and this has had a positive impact on the field of artificial intelligence.

References

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