

AIND Project 3: Domain Independent Planner

Research Review

On

Historical Developments in Field of AI Planning and Search

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In this short review some of the major planning and search developments are discussed with a primary goal to highlight their influence in Artificial Intelligence Filed.

Planning Domain Definition Language (PDDL)

The Planning Domain Definition Language (PDDL) was developed in 1988 by Drew McDermott and his colleagues to make International Planning Competition possible. It then evolved with each competition [1].

PDDL was mainly inspired by STRIPS, and ADL (Action Description Language), which is also a simpler representation of STRIPS. It allows us to encode more realistic problems by removing some of the STRIPS restrictions [2]. The usage of this language encourages greater reuse of research, allows the user to think in easier way and thus, aids faster progress in AI field.

The latest version of this language is PDDL 3.1. The advancements in this field are still going on and the extensions of PDDL can be seen as PDDL+, NDL (New Domain Definition Language), MAPLE, PPDL (Probabilistic PDDL) etc.

Stanford Research Institute Problem Solver (STRIPS)

STRIPS is an automated planner designed by Richard Fikes and Nils Nilsson at SRI International in 1971. It was primarily used for robot research at SRI. This language is used as a base language for most of the languages expressing planning problems used today [3].

The impact of STRIPS in the field of artificial intelligence was greater in terms of representation language because it is very close to “classical” planning language. It is described as a set of applicable operators which are allowed to transform from one

state to another. This definition to solve complex planning problems has been a point of focus to many research works in the developing field of AI [4].

WARPLAN

WARPLAN is a planner written by David Warren which implements a solution known as goal-regression planning to the interleaving problem. It was the first planner to be written in Prolog language [2].

Early research in planning domain normally used linear programming. This approach was soon considered as incomplete. Thus the implementation of this planner using logical language (Prolog) was a great benefit in terms of reduced complexity. WARPLAN is only 100 lines of code [2].

References

- 1- https://en.wikipedia.org/wiki/Planning_Domain_Definition_Language
- 2- Stuart J. Russell, Peter Norvig, Artificial Intelligence: A Modern Approach.
- 3- <https://en.wikipedia.org/wiki/STRIPS>
- 4- Nilsson, N. J. Problem-Solving Methods in Artificial Intelligence.