3 Historical Developments in the Field of AI

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STRIPS and Shakey-the-Robot

STRIPS is the first major classical planning language and a problem solver developed by Fikes and Nilsson of Stanford University in the late 60s and early 70s [1,2]. It represents the world in first-order logic and finds a plan which comprises of a sequence of actions to transform an initial state of the world model into a given goal state. STRIPS made up the core planning software component Shakey [3] which was an office-fridge sized robot on wheels and was able to see the world through its TV cameras. Shaky project also provided the motivation for the development of the A^* algorithm and was able to navigate and also fetch and move boxes between rooms. While Shakey's physical dexterity and navigational abilities were limited, its software algorithms proved revolutionary in the field of AI.

Planning Domain Definition Language (PDDL)

PDDL was developed by the AIPS 1998 Planning Competition committee chaired by Drew McDermott. It was inspired by several planning languages including STRIPS and ADL [5] that allow to encode more realistic problems by relaxing some of the restrictions and encompasses the expressiveness and functionality of its forebears.

PDDL is an attempt to standardize the existing planning languages. It is intended to express the "physics" of a domain explicitly such as what predicates there are, what actions are possible, what the structure of action compounds is and what the effects of actions are. Because of its comprehensive nature, PDDL is factored into subsets of features called "requirements". Every domain defined in PDDL is supposed to declare its requirements.

Graphplan

The `Graphplan` algorithm [6] operates on STRIPS-like domains and is based on a "Planning Graph Analysis". Where standard planning methods directly embark on a search routine, `Graphplan`, instead, constructs a compact structure called the *Planning Graph* which organizes the search information and the constraints that reduces the amount of search needed. One other appeal of it is that the graph is of polynomial size and is constructed in polynomial time.

References

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